GATES LEARJET CORPORATION

maintenance manual

CHAPTER

20

STD. PRACTICES - AIRFRAME

RECORD OF TEMPORARY REVISIONS

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SEALANTS - DESCRIPTION AND OPERATION

1. General
 A. Sealing of the aircraft is required to eliminate leakage of air pressure, water, fuel, dust and heat.
 B. This section provides sealing procedures necessary for performing maintenance on the aircraft. It does not include structural repair sealing.
 C. There are basically three types of sealing used on the aircraft. Weather sealing is used to protect equipment from rain and dust. Pressure sealing is used to prevent loss of cabin pressure during high altitude flight. Fuel sealing is used to restrict fuel to the areas where it is least subject to combustion.

2. Tools and Equipment
 A. The following materials have been found to be the most efficient in their applications and must not be interchanged.

NAME	NUMBER	MANUFACTURER
	SEALANTS	
Sealant (Class A)	Pro-Seal 890	Coast Pro-Seal and Mfg. Co. Los Angeles, Calif.
Sealant (Class B)	Pro-Seal 890	Coast Pro-Seal and Mfg. Co. Los Angeles, Calif.
Sealant (Class C)	Pro-Seal 890	Coast Pro-Seal and Mfg. Co. Los Angeles, Calif.
	SOLVENTS	
Naptha Petroleum Aromatic	TT-N-97	Commercially Available
Ethyl Acetate	TT-E-751	Commercially Available
Isopropyl Alcohol	MIL-F-5566	Commercially Available
Aliphatic Naptha, Type II	TT-N-95	Commercially Available

NAME	NUMBER	MANUFACTURER
	TOOLS	
Sealant Removal & Cutting Tools	(See figure 1)	Locally Manufactured
Sealant Fairing Tools	(See figure 1)	Locally Manufactured
Stiff Bristle Brushes	(Not nylon)	Commercially Available
Solvent Dispensers	(Polyethylene squirt bottle)	Commercially Available
Sealant Gun	Semco No. 250	
Polyethylene Nozzles	(For Sealant Gun)	
Polyethylene Cartridges	(For Sealant Gun)	
	MATERIALS	
Clean White Cotton Cloth		
Vinyl Plastic Tape	CT-93 (.010" x 1")	Borden Chemical Company
White Cotton Gloves		Commercially Available
Masking Tape		Commercially Available
Parting Agent	(One part by weight MIL-I-7444 vinyl tubing dissolved in four parts cyclo-hexanone.)	

3. Preparation for Sealing
 A. Accomplish the following prior to starting work on any sealant application.
 (1) Determine whether any structural repair is necessary and if so, repair in accordance with standard structural repair practices.
 (2) Examine sealing in area of leakage and determine the seal level and seal plane in adjacent structure.

NOTE: The seal plane is defined as being the boundary plane through any assembly of structural items which presents a continuous barrier to the flow of fluids or gases.

(3) Identify the type of sealant used in area of defect.
(4) Determine the type of seal; fillet, faying surface, etc., which will be required to carry out repair.

NOTE: Do not interchange sealing compounds. The material originally used has been found to be the most efficient for sealing the area.

(5) Completely remove or notch sealant in the affected area to produce a solid residual material. Cutting tools shall be of hardwood material. Metal cutting tools may cause structural damage. Sealant cutting tools may be locally manufactured. Refer to figure 1.
(6) Examine rework area for clean cuts and adequate notching and for access. Loose chunks or flaps of sealant on cut areas shall be removed.
(7) Immediately prior to sealant application, remove grease, oil, dirt, and chips from all surfaces to which sealant compound is to be applied. Refer to Cleaning.

4. Cleaning

A. Cleaning should be accomplished immediately prior to sealant application as follows:
(1) Fold cotton cloth in such a manner as to eliminate raw edges to reduce the possibility of lint.
(2) Dampen the cloth with cleaning solvent from a polyethylene squirt bottle. The cloth should not be saturated to a point where the solvent drips.

WARNING: SPECIAL PRECAUTIONS SHOULD BE OBSERVED DURING CLEANING. CLEANING SOLVENTS ARE TOXIC AND INFLAMMABLE. FRESH AIR MASKS AND/OR ADEQUATE VENTILATION SHOULD BE AVAILABLE IN ALL CLOSED AREAS.

NOTE: Never pour or spray cleaning solvent on aircraft structure. If this is done, the solvent may run back between structure layers, then creep back out again after cleaning operations are completed, bringing contamination to surface previously cleaned.

(3) Thoroughly scrub the area to be sealed. Extreme care should be exercised to clean inaccessible corners, gaps, etc. A small paint brush or pipe cleaners may be used for these areas. Always clean an area larger than that required for the sealant.

(4) Before the solvent has evaporated, wipe the area dry with a clean dry cloth.

(5) Repeat steps (3) and (4) until no discoloration is evident on the drying cloth.

NOTE: If some primer is removed during cleaning, the exposed metal surface need not be further treated provided the cleaning is accomplished per steps (3), (4) and (5). However, if primer is completely removed, reprime surface after completion of all sealing.

(6) After the surfaces are thoroughly cleaned, personnel should wear clean white cotton gloves to prevent surface contamination.

5. Types of Seals

A. Fillet Sealing (See figure 2)

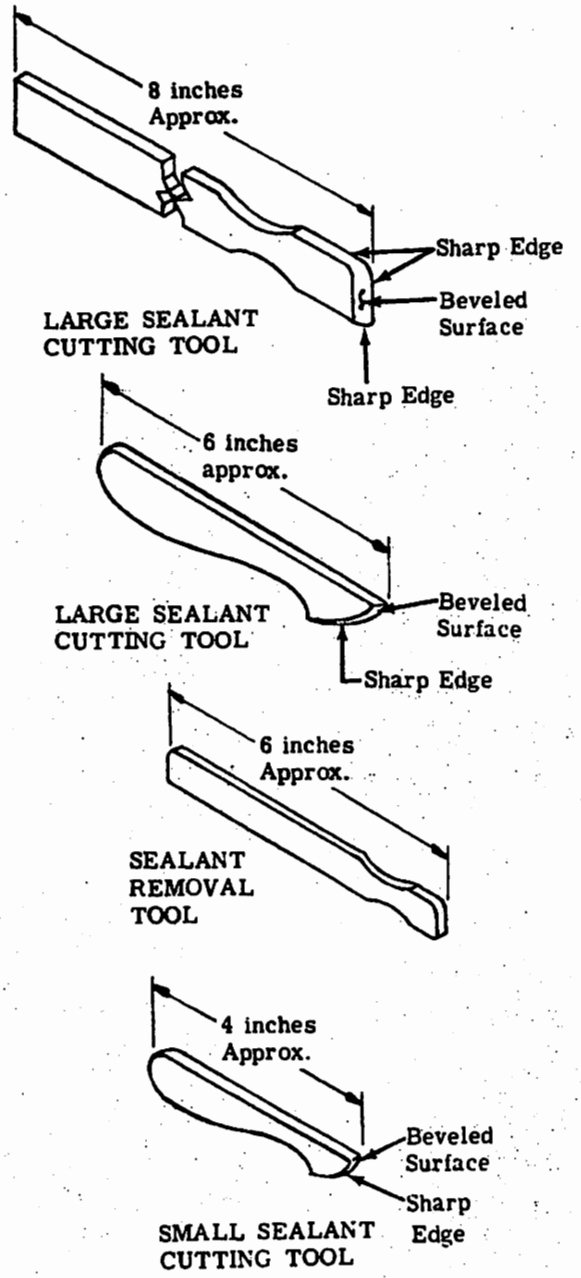
(1) Fillet sealing is the application of a bead of sealant to cover seams or joints and is the basic sealant application used on the fuel tank structure. This type of sealing will be used in most cases for the repair of fuel tank leaks. Fillet seals are used to cover structural joints along stiffeners, tank walls, wing spars, and to seal around fittings on tank walls and in corners. The dimensions represent typical finished fillet shapes for various applications. Fillets should conform to the dimensions as near as possible since the shapes of a fillet determines its service life. The metal surfaces must be absolutely clean before a fillet seal will adhere properly.

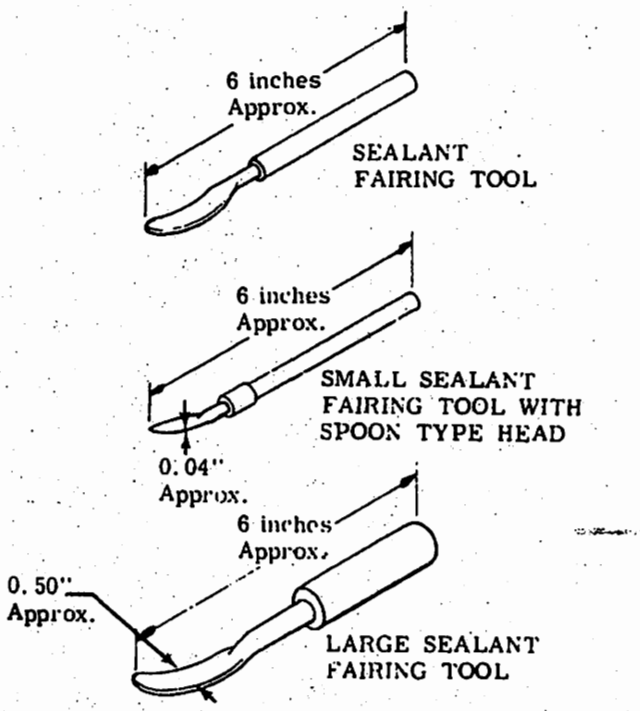
B. Injection Sealing (See figure 3)

(1) Injection sealing is the filling of holes or channels by forcing sealant through the void or cavity. Injection seals may be applied to provide continuity where fillet seals are interrupted by structure (Example: fuel tank boundaries). Holes, joggles, and channels along seams which are to be fillet sealed are also injected full of sealant to provide a backup seal to support the primary fillet seal. Injection sealing acts to force air out of a cavity and to fill the vacant space with a solid block of sealant.

C. Faying Surface Sealing (See figure 4)

(1) Faying surface sealing is the sealing of two flat surfaces fastened together, one on top of the other, before the parts are assembled. This type of seal is used especially to seal areas that are hard or impossible to seal after assembly.





NOTE: These tools should be made of hardwood to reduce the possibility of structural damage.

Sealant Cutting Tools

NOTE: These tools may be made of 1/4 inch diameter bronze or steel welding rod and may be plated to improve smoothness.

Sealant Fairing Tools

Sealant Cutting and Fairing Tools
Figure 1

D. Pre-Pack Sealing
(1) Pre-pack seals are used to fill voids in structure which cannot be reached by the injection method. These voids are packed with sealant before they are closed by the assembly structure members.

E. Electrical Wire Sealing (See figure 5)
(1) Electrical wire bundles are sealed at the point where they pass through a pressure bulkhead. The bulkhead fitting is filled with sealant to assure leakage does not exist around wire bundles.

F. Fastener Sealing (See figure 6)
(1) Fastener sealing is the application of a fillet seal over rivets, bolts, nuts, and nutplates. Fasteners which pierce the pressure vessel or wet wing fuel tanks require sealing. Sealing of rivets installed in the wet areas of the wings is accomplished by brush stroking (in two directions) to apply a coating of 0.005 to 0.015-inch thick sealant inside of the wing. Tooling holes (in the wet wing areas) are plugged with soft rivets and then brush-coat sealed.

G. Hole and Slot Sealing
(1) Tooling and coordination holes are closed with soft rivets except when one side is not accessible and in that case they are sealed. Sealant is also used for plugging joints, gaps, joggles, and holes provided their size does not exceed the specification limits shown. All sealing is done on the pressure side. This assures that pressure will hold seal in place.

6. General Application Requirements
A. Sealant shall not be applied at temperatures below 60°F or to structure that is below 60°F.
B. As a general rule, repair sealant should not be added to areas or parts which were not originally sealed. If the source of a leak appears in an area which was not originally sealed, the cause of the leak is probably failure of a prepack of faying surface not visible. Application of additional sealant would only temporarily stop the leak. A study of the surrounding structure should be made for hidden seals. As an option to replacing a failed prepack, injection or faying surface seal, the failed seal may be isolated by raising (relocating) the seal plane. Raising the seal plane can involve an extensive amount of sealant addition so in many cases structure removal and replacement of the failed seal will be the best action.
C. Sealant in the integral fuel tanks shall be applied over epoxy finish.
D. Do not move or handle sealant structure, other than faying surface seals, until the sealant is tack free.
E. Sealing compounds must be properly prepared and applied. Application of sealant is a noninspectable item as the quality or work cannot, in most instances, be immediately determined upon completion. Therefore, close attention to details and faithful accomplishment of the functional steps of the repair in the proper order are most essential.

F. Directions for mixing sealing compounds, sealant work life and the time it takes for the sealant to cure must all be carefully supervised.

G. It must be remembered that if all preparation work is done properly and then the sealant is applied to a surface that is not properly cleaned, the sealing will not be satisfactory as the sealant will never adhere to a dirty surface.

H. Repair of failed sealant is not a speedy operation. Less manhours will be expended in the long run if ample time is allowed to properly examine and repair the sealant. Effective original repairs will alleviate repetitions and prevent sealing difficulties.

7. Sealant Mixing

A. Brushable sealant (Type A) can be mixed in any quantity desired but, unless refrigeration facilities are available for storage, mix only as much as required for the work at hand. A balance scale with graduated weights should be available for mixing unless the small kits with the proper amount of accelerator and sealant in one package are used. All equipment used in the mixing process must be clean.

(1) Place approximate amount of base compound to be used on scale and balance with weights.

(2) Add additional weights to give accelerator-to-base compound ratio as called out on manufacturer's sealant container.

(3) Balance scale by adding accelerator, placing accelerator on top of base compound.

CAUTION: USE CARE TO AVOID INCORPORATING AIR INTO SEALANT DURING MIXING PROCESS. BE SURE THAT THE SEALANT IS MIXED UNTIL NO STREAKS OR AREAS OF NON-UNIFORM COLOR REMAIN.

(4) Thoroughly mix accelerator and base (minimum of 5 minutes) until sealant of solid uniform color is obtained.

NOTE: Always use accelerator with base compound from same repair kit. Do not mix accelerator from one repair kit with base compound from another kit.

(5) Place sealant in tube or can which has been cleaned with methyl ethyl ketone. Sealant is now ready for use.

8. Method of Application

A. Sealant material may be applied with a brush, an extrusion gun, or a spatula. Each method works best in a particular situation. The following paragraphs describe these methods and the situations in which they are used.

(1) A stiff-bristled brush (not nylon) is used to apply the precoat of class A sealant. Sealant should be brushed thoroughly onto the surface and into the joint which is to be sealed.

(2) Fillet, faying surface, and pre-pack seals may be applied with an extrusion gun. Injection seals must be applied with an extrusion gun. The extrusion gun uses air pressure to force the sealant material through a nozzle onto the surface or into the cavity to be sealed. Nozzles are available in different sized beads of extruded sealant. The nozzle tips may be shaped locally to produce a bead of sealant with the shape and dimensions to fit a specific job.

(3) A spatula is used to spread sealant material for faying surface

and pre-pack seals. Small repair fillet seals may be applied with a spatula if an extrusion gun is not available.

9. Fillet Sealing
 A. Repair Fillet Seal (See figure 2)
 (1) Use sealant cutting tools similar to those shown in figure 1.
 (2) Cut faulty section from fillet. Slope cuts at ends of section so that new sealant will lap remaining portions of old fillet in these areas. Avoid abrupt changes in cross section.

 NOTE: Remove enough sealant on both sides of defective area to be sure that remaining material is satisfactory.

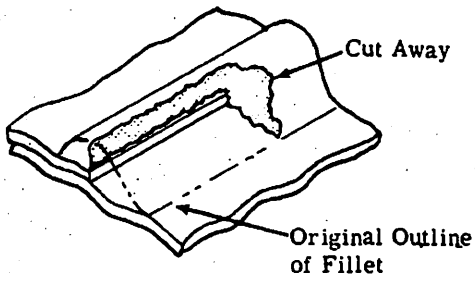
 (3) Examine all cut surfaces. Remove loose cuts or flaps. Make sure that no faulty sealant remains. If fillet adhesion is good, it is not necessary to cut sealant down to bare metal.
 (4) Refinish damaged surface if necessary.
 (5) Clean surface to be sealed.

 NOTE: If epoxy finish is removed in the fuel area during cleaning operation, it is permissible to seal directly over the bare metal. Touch up exposed areas after the sealant has been applied.

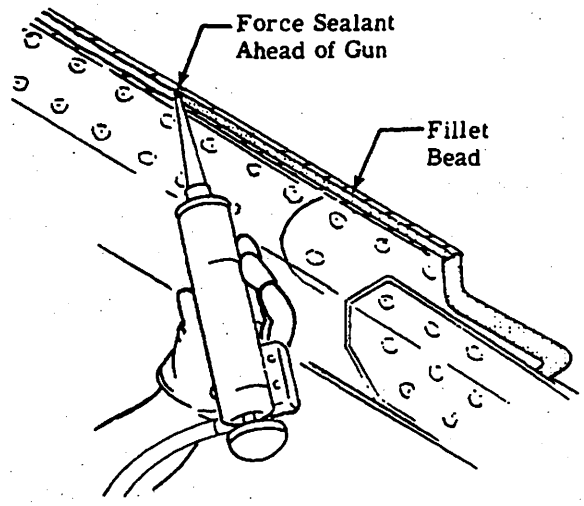
 (6) Apply new fillet seal.
 B. Repairing Fillet Sealed Fasteners
 (1) Leaking fastener fillet seals are repaired by replacing the faulty sealant. Proceed as follows.
 (2) Using a sealant cutting tool, cut around seal at base of fastener to separate sealant from structure.
 (3) Grasp seal with pliers and pull up away from fastener end. Most of seal should be removed by this process.
 (4) Cut away remaining sealant with cutting tool. Small quantities of sealant which adhere firmly to fastener need not be removed.

 NOTE: Tightening fasteners during or after sealing destroys sealant effectiveness.

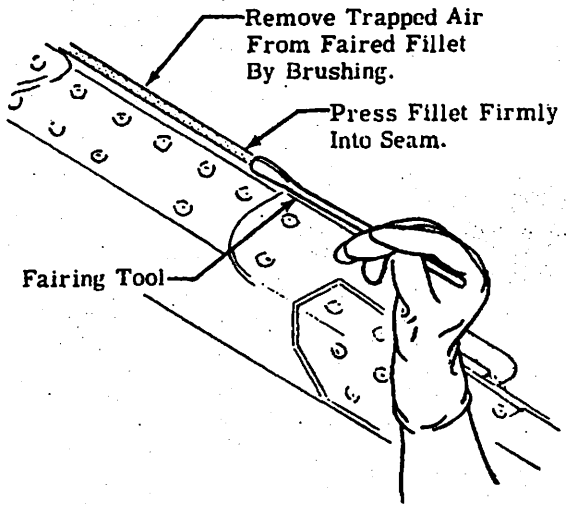
 (5) Clean fastener and surrounding area with cleaning solvent.
 (6) Using an extrusion gun or spatula, apply a coat of Type B sealant around and over fastener.
 (7) Work sealant with fairing tool until fillet seal dimensions given in figure 2 are obtained.
 (8) Use extreme care to eliminate any visible voids or bubble areas around the fastener base.



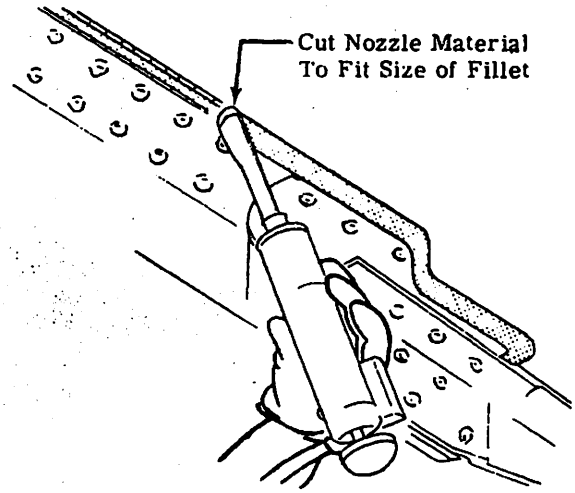
Fillet Seal Removal



Application of First Fillet

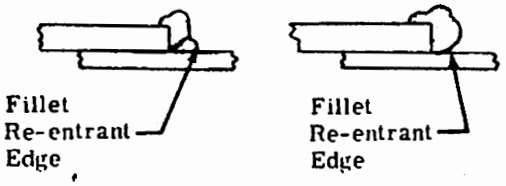


Pressing First Fillet Into Seam

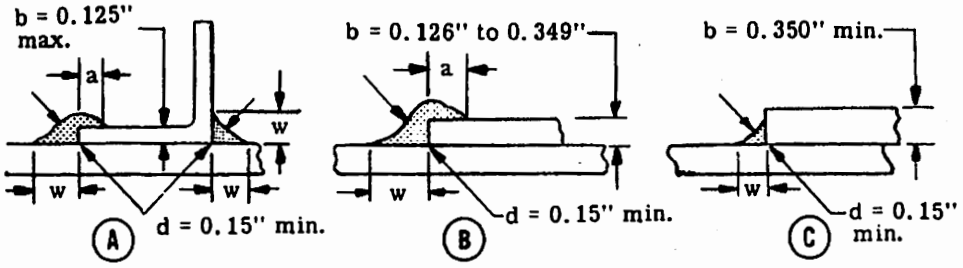


Application of Final Sealant

Fillet Sealing
Figure 2 (Sheet 1 of 2)



Re-Entrant Fillet



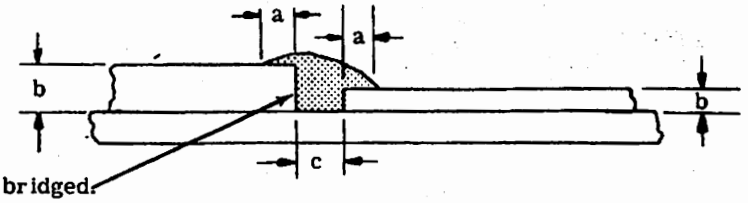
For View (A)
w = 0.25" to 0.50"

For View (B) and (C)
w = 0.35" to 0.50"

a+b=w, except a=0 when b=0.35" or more.

Fillet Dimensions

a=0.15" min., except a=0 when b and c=0.35" or more.



Gap must be filled, not bridged.

Butt Joint Fillet Dimensions

Fillet Sealing
Figure 2 (Sheet 2 of 2)

C. Apply New Fillet Seal (See figure 2)

(1) Prior to fillet sealing, all fasteners in the area to be sealed must be installed. All bolts must be torqued to their respective values as retorquing is not permitted after sealing. The proper nozzle for the sealing gun must also be used. If a small fillet is to be applied, use a small nozzle; a large fillet requires a large nozzle.

(2) With extrusion gun, apply a small fillet of Type B sealant as shown in figure 2.

(3) When a nozzle tip is used, point it into the seam and maintain nearly perpendicular to the line of travel.

CAUTION: SEALANT MUST BE APPLIED CAREFULLY TO AVOID TRAPPING AIR IN FILLET. OPERATE GUN SO THAT A BEAD OF SEALANT IS CONTINUALLY FORCED AHEAD OF NOZZLE TIP IN THE DIRECTION OF NOZZLE TRAVEL.

(4) Using a fillet fairing tool, press the first fillet firmly into position as shown. Work the entire beaded section.

CAUTION: CHECK THAT THE FAIRING TOOL IS ABSOLUTELY CLEAN. USE NO SOLUTION OR LUBRICANT TO MAKE IT SLIDE SMOOTHLY OVER THE SEALANT. WIPE THE TOOL WITH CLEAN GAUZE FREQUENTLY TO AID IN THE FAIRING OPERATION.

(5) If the first fillet has cured but is not clean, then it must be cleaned before the application of the second fillet.

(6) Apply the second application of Type B sealant to produce a full bodied fillet as shown. A larger nozzle will be required than was used for the first fillet. If an extruded nozzle head is used, make cuts in nozzle to fit fillet and make it conform to the dimensions given in figure 2. If extruded head nozzle is not used, use a fairing tool as required to make sealant conform to the full bodied fillet dimensions.

NOTE: Keep the sealing gun nozzle right on the work to prevent inclusion of air bubbles between fillets. Do not hurry. Good sealant application requires patience as well as proper technique. If a fillet extrusion head is used, the head shall be pressed frimly against the part in such a position that the maximum thickness of the fillet will be directly over the edge.

(7) Work out any evident air bubbles.

(8) Fillet re-entrant edges are not acceptable.
(9) A typical finished fillet seal with dimensions is shown in figure 2.

10. Injection Sealing
A. Repair Injection Seal
(1) Remove sealant from short injection channels with a hooked wire and small cutting tools. Longer injection channels require disassembly of structure.
(2) Clean injection channel all the way through since trapped air will prevent complete filling of the channel with sealant.
(3) Exercise care so that structure is not damaged during the removal process.
(4) Clean channel with cleaning solvent and pipe cleaners.
(5) Apply solvent with saturated pipe cleaner or brush. Wipe surface dry with pipe cleaner. Repeat until drying cleaner remains clean.
(6) Clean channel at least once more after visible evidence of impurities has been removed and the surfaces are thought to be clean.
(7) Apply new injection seal.
B. Apply New Injection Seal (See figure 3)
(1) To apply a new injection seal, a fairing tool, pipe cleaners, and an extrusion gun with an injection nozzle attached are required.
(2) Make sure channel is thoroughly cleaned.
(3) Inject channel full from one end only with Type B sealant until sealant emerges from all other openings. Completely fill joggles and channels that require continuity of seal or block off seal.

CAUTION: BE SURE GUN HAS ENOUGH SEALANT TO MAKE COMPLETE SEAL AT ONE INJECTION WITHOUT ANY BREAK. STOPPING AND STARTING WILL CAUSE AIR BUBBLES IN SEAL AND IS CAUSE FOR REJECTION OF JOB.

(4) Remove excess sealant with fairing tool and smooth out ends of seal.
(5) Inspect finished job, checking for poor adhesion and air bubbles. Any air bubble is cause for rejecting a seal. Rework only area that has bubbles.
(6) Check that the area where the sealant protrudes into the fillet seal area has no abrupt changes in section. Sealant must be faired out gradually into the area that is to be fillet sealed.

11. Faying Surface Sealing
A. Repair Faying Surface Seal (See figure 4)
(1) Disassemble structure surrounding seal.
(2) Remove all sealant from faying surfaces with sealant cutting tools and suitable plastic scrapers.

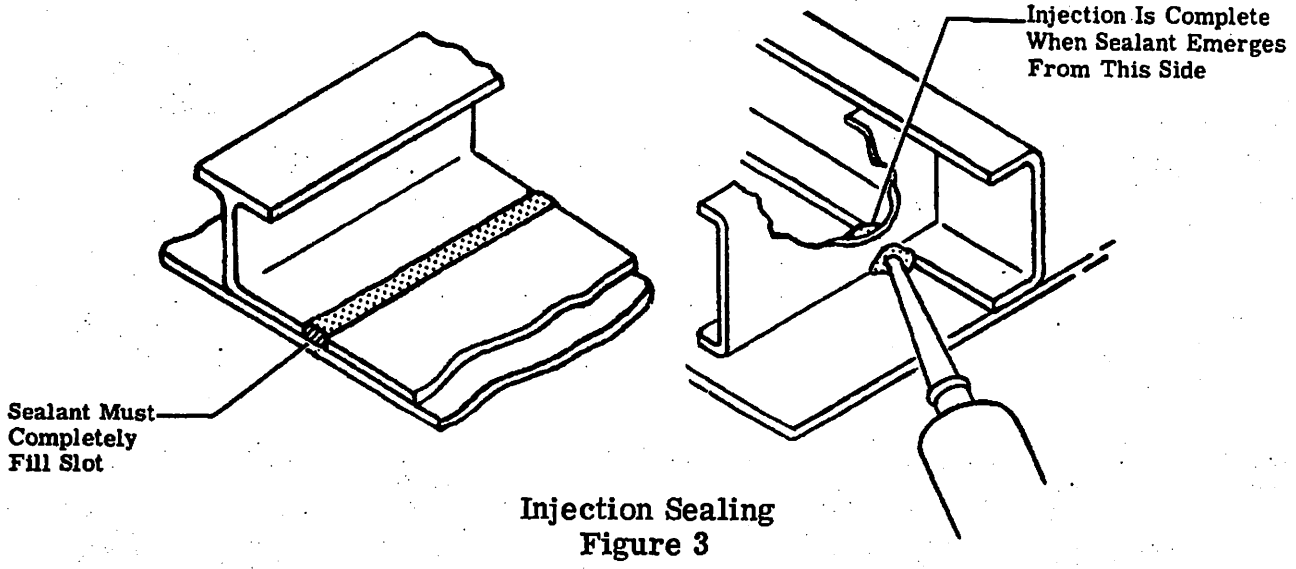
(3) Refinish damaged surface.
(4) Clean faying surfaces with cleaning solvent.
(5) Apply a coat of Type B sealant to one faying surface with a roller, an extrusion gun, or a spatula. Spread the sealant over the entire surface to obtain a uniform coating.
(6) Removable seals shall be applied with the use of a parting agent. The parting agent shall be applied to one surface. Paint shall be omitted from this surface. When the parting agent is dry to the touch, the parts may be assembled with a faying surface seal. If the part is removed, the sealant shall be removed, new parting agent applied, and resealed.

NOTE: The parting agent is one part by weight of MIL-I-7444, vinyl tubing, dissolved in four parts of cyclohexanone. Do not apply this parting agent over paints, primers, or on acrylics.

(7) Assemble parts within sealant work life.
(8) Fair out extruded sealant to leave a smooth fillet along joint.

NOTE: Sufficient sealant must be applied to insure a continuous extrusion on both sides of the joint after assembly of the faying surfaces.

12. Pre-Pack Sealing
A. Failed pre-pack and faying surface seals are normally repaired by raising the seal plane to isolate the failed seal from fuel. As an option, the structure surrounding the faulty seal can be disassembled, a new seal applied, and the structure reassembled. To replace a failed pre-



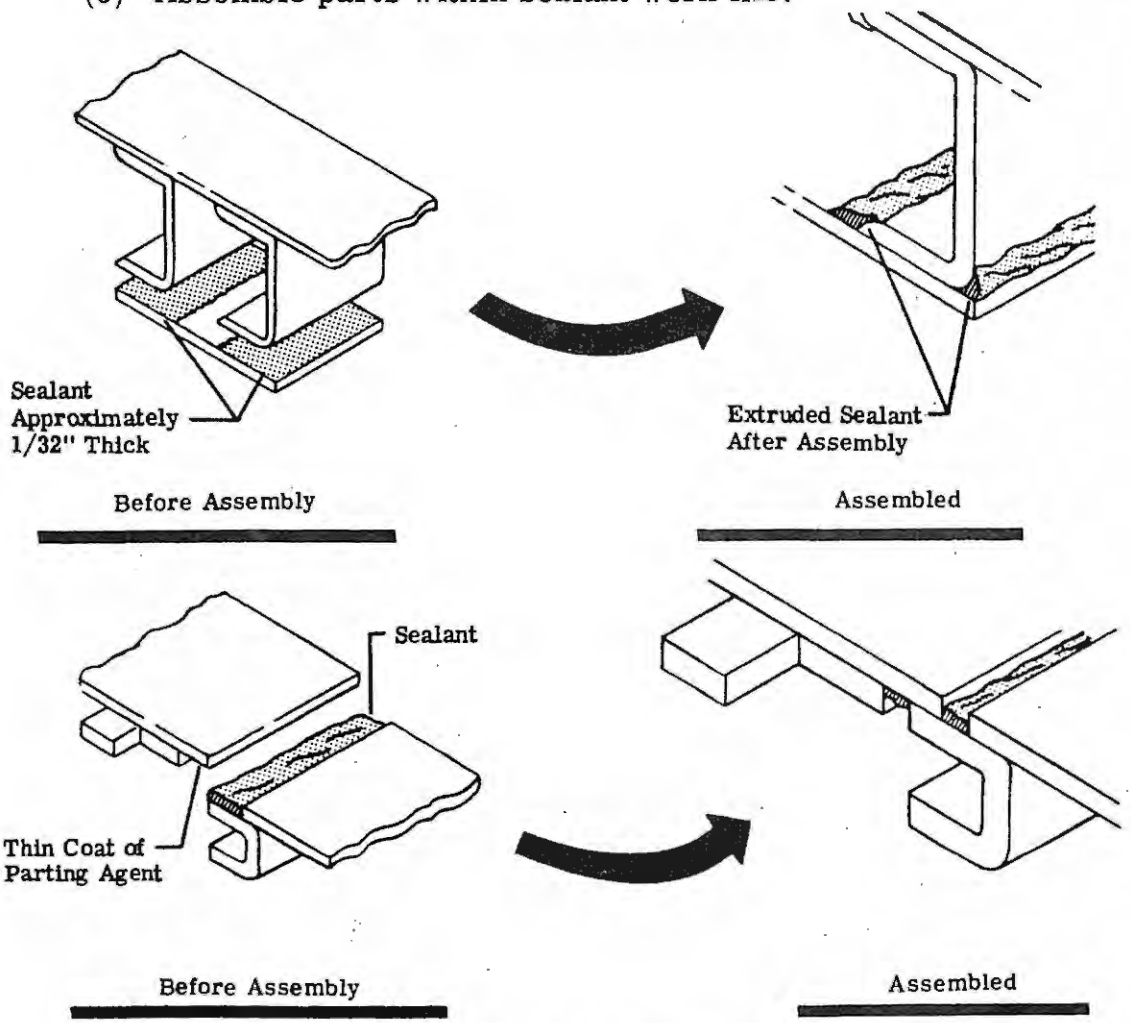
Injection Sealing
Figure 3

pack seal, proceed as follows:

(1) Disassemble structure surrounding seal.
(2) Remove all sealant from pre-packed cavity with sealant cutting tools and suitable plastic scrapers.
(3) Complete all preassembly operations such as hole drilling and burring. Use only Shell L-73101 or Mobil Met 35 lubricants for preassembly drilling or burring operations.
(4) Clean parts with cleaning solvent.
(5) Apply a coat of Type B sealant to one of the parts. Shape the sealant with a fairing tool to the general contours of the cavity.

NOTE: Sufficient sealant must be applied to insure complete filling of the cavity.

(6) Assemble parts within sealant work life.



Faying Surface Sealing
Figure 4

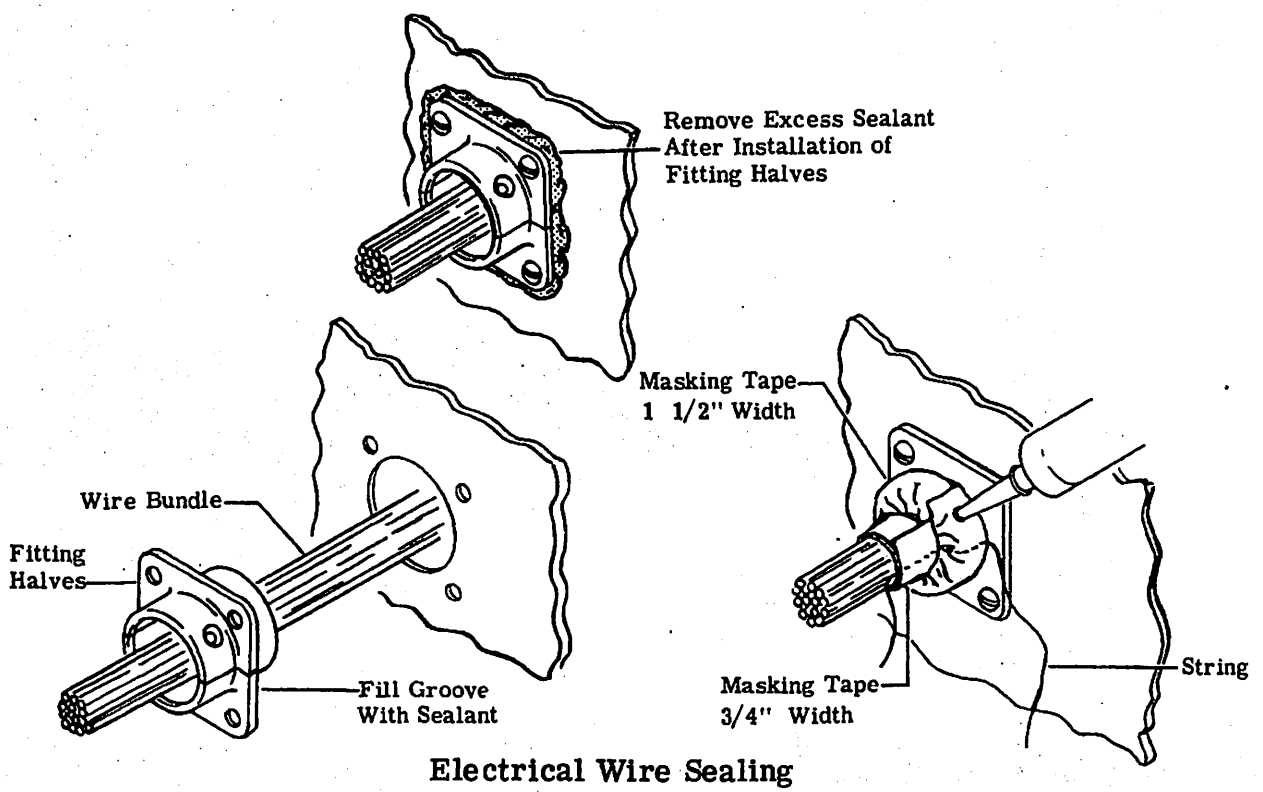
13. Electrical Wire Sealing

A. Seal Electrical Bulkhead Fittings (See figure 5)

(1) Clean the area where seal fittings will seal.
(2) Pass wire bundle through the cutout provided.
(3) Place seal fitting halves around wires in the bundle with flanges on the pressure side.
(4) Fill the groove in the mounting flanges with sealant.

NOTE: Use sufficient sealing to assure that sealant extrudes continuously around the mounting flanges after they are secured to the bulkhead.

(5) Secure fittings to bulkhead with fasteners.
(6) Remove any excess sealant which extrudes from the mounting flanges.
(7) Place a strong piece of string about 8 inches long against the seal assembly parallel with the wires.
(8) Wrap fitting halves with three turns of 1-1/2 inch wide masking tape.
(9) Crimp the masking tape around the seal assembly ends so as to center the wire bundle.
(10) Wrap crimped end with three turns of 3/4 inch masking tape.

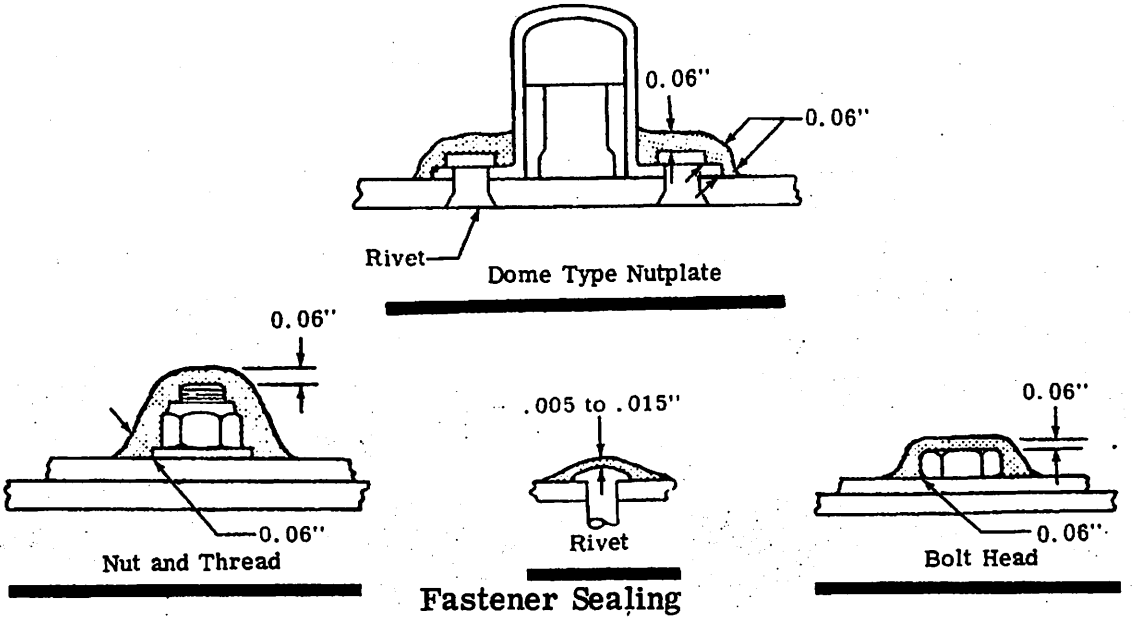


Electrical Wire Sealing
Figure 5

(11) Puncture the paper masking tape over the most convenient injection hole in the seal fitting.
(12) Inject sealant using a sealant gun.
(13) Seal over the seal fitting fasteners.
(14) Remove tape after sealant has cured (16 to 24 hours) by pulling rip string and unwinding.
(15) Where a cover plate is used to cover an unused opening, apply a faying surface seal between plate and structure.

14. Hole Sealing
A. Seal Tooling and Coordination Holes
(1) Plug tool and coordination holes with soft rivets.
(2) Clean area to be sealed.
(3) Apply Type A sealant over rivet butt and/or head. Sealant may also be applied to the structure. Apply by brushing in two directions until a coating of 0.005 to 0.015 inch thickness is obtained.

15. Fastener Sealing
A. Seal Nutplates, Nuts, Bolts and Rivets as follows. (See figure 6)
(1) Clean fastener and area around fastener.
(2) Using an extrusion gun or spatula, apply type B sealant around fastener. When sealing nutplates, assure that the attaching rivets are sealed.
(3) Work sealant with a fairing tool to obtain fillet seal dimensions shown.
(4) Use extreme care to eliminate any visible voids or bubble areas around the base of the fastener.



Fastener Sealing
Figure 6

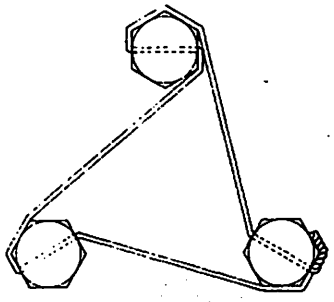
SAFETY WIRING - MAINTENANCE PRACTICES

1. General
 A. Safety wiring is utilized throughout the aircraft to secure parts which might possibly work loose in service.
 B. Two methods of safety wiring are used; single wire and double wire. Inconel safety wire, 0.032 inch diameter, is most commonly used. When safetying emergency equipment, a soft copper wire, 0.020 inch diameter, is generally used. Extra high strength safetying requires a corrosion resistant steel wire which is 0.062 inch diameter. Whenever removing an assembly which is safety wired, note the method in which it is safety wired as well as routing, size and type of wire. Safety wire is not used in fuel tanks due to the possibility of static discharge.
 C. The most common use of the single wire method is on emergency equipment. The wire in this application is strong enough to safety the part yet is easily broken when use of the emergency equipment is required. The single wire method is also used when a series of three or more parts, usually small screws or bolts, are in a geometric pattern (square, rectangle, triangle or circle). A third application of the single wire method is safetying hard to reach parts which are impractical to double wire.
 D. Double wire safety wiring is the most common method used on the aircraft. When double wire safetying in a series the direction of twist must be reversed at each unit. When safetying widely spaced series using this method, the maximum number of units is 3. Wire twisting pliers are used to obtain a uniformly tight twist in the wire.

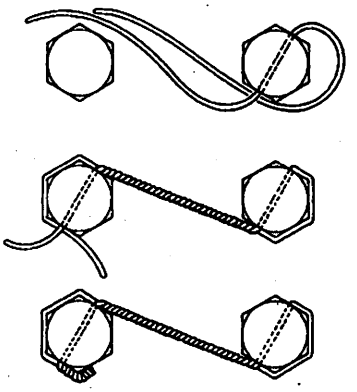
2. Safety Wiring Precautions
 A. The following precautions should be observed when safety wiring.
 (1) When removing safety wire assure that all pieces are removed.
 (2) Use only new safety wire of the same type, temper and diameter as that which was removed. Never reuse safety wire.
 (3) Handle safety wire in a manner that it will not become kinked, nicked, scraped or flattened.
 (4) Do not grip too tightly with tools or over-twist wire.
 (5) Avoid pulling wire around sharp corners.
 (6) Install safety wire so that it tends to tighten the part.
 (7) Do not loosen or overtorque parts to improve safety wire hole location.
 (8) Do not drill unspecified safety wire holes.
 (9) When cutting the end of the safety wire, leave approximately 6 twists of wire. Never twist off end of wire.

(10) Bend final end toward part in a manner that will not cause injury to hands or interfere with moving parts.
(11) Never safety wire more bolts or screws in a series than can be done with a 24 inch length of wire.

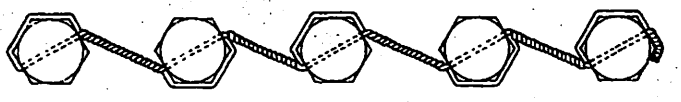
3. Safety Wiring
A. See figure 1 for safety wire applications.



SINGLE WIRE SAFETYING

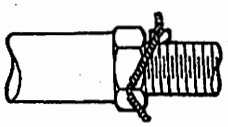


DOUBLE TWIST SAFETYING

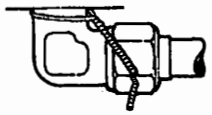


DOUBLE TWIST SAFETYING
MULTIPLE GROUPS

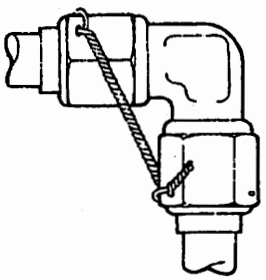
Safety Wiring
Figure 1 (Sheet 1 of 2)



ROD END AND KEY LOCK



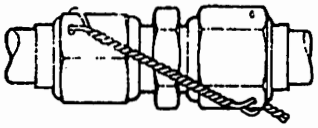
SINGLE "B" NUT CONNECTION TO ELBOW



ELBOW FITTING



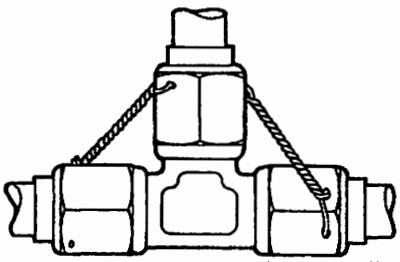
SAFETY LOCK WASHER



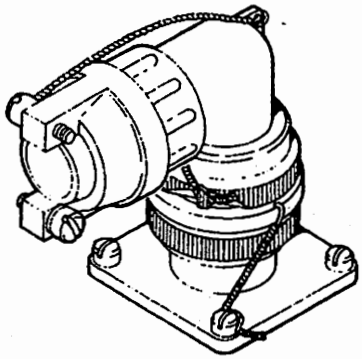
UNION FITTING



TOP VIEW



TEE FITTING



ELECTRICAL CONNECTION

Safety Wiring
Figure 1 (Sheet 2 of 2)

LOCTITE - MAINTENANCE PRACTICES

1. General
 A. Loctite is used on the aircraft when it is impossible to safety wire a fastener or if safety wire is impractical.
 B. Use figure 1 as an aid in determining the kind of Loctite to use in a given application. Use only the recommended compounds in their given applications.

2. Applying Loctite
 A. Prepare Surface
 (1) Clean all parts to which Loctite is to be applied. Surfaces must be clean and free of dust, grease, condensation, moisture and other contaminates.
 (2) Parts that are plated, hardened, anodized or passivated must be treated with Locquic primer grade N or T prior to applying Loctite sealant or compound. The Locquic primer odor must be completely gone before applying Loctite.
 B. Apply Loctite to Bearings
 (1) If Loctite type has not been specified, selection is to be made from figure 1.
 (2) Apply Loctite evenly to both mating surfaces. Exercise care to keep Loctite out of the bearing. Excessive Loctite may be wiped off with a rag moistened in trichlorethane.
 (3) Press bearing into bearing housing and keep aligned until Loctite cures. Assembly may be heated for 30 minutes at 180° to accelerate curing time.
 C. Apply Loctite to Threaded Fasteners
 (1) If Loctite type has not been specified, selection is to be made from figure 1.
 (2) Apply Loctite to threads by brushing, dipping, tumbling or running applicator over the threads.

 NOTE: Loctite may be applied to either the nut or bolt; however for blind hole applications, coat the sides of the blind hole and the first two threads of the male fastener.

 (3) Assemble parts and torque using normal torque.
 (4) Excessive Loctite may be removed using a rag moistened with trichlorethane.

EFFECTIVITY: ALL

Application of Loctite
Figure 1 (Sheet 1 of 2)

Sealant/Compounds △	Shear Strength PSI at RT	Prevailing Frictional Strength at RT	Cure Time In Hrs. (Unprimed)	Viscosity (CP)	Max. Clearance In Inches	Color	Application
Stud Lock/AVV	- - -	750-1000	1-2	400-1200	.005	Red	Locks 1/4"-2" studs in tapped holes. Service temperature: -65 to 300°F.
Nut Lock/CV	- - -	300-400	1-2	100-150	.003	Blue	Locks nuts up to 1" and prevents vibration loosening. Service temperature: -65 to 300°F.
Screw Lock E/V	- - -	150-200	1-2	100-150	.003	Purple	Locks No. 2 to 1" screws and prevents vibration loosening. Service temperature: -65 to 300° F.
Bearing Mount	375-1300	- - -	1-4	100-150	.003	Yellow	Makes anti-friction bearing fits more reliable. Service temperature: -65 to 300° F.
Retaining Compound 35	3000-7000	- - -	12-24	2000-3000	.003	Green	High strength for bonding of parts to shaft, bearings, or threaded parts. Service temperature: -65 to 300° F.
Retaining Compound 40	2000-4000	- - -	12-24	500-700	.003	Green	Bonding of parts to shaft, bearings, or threaded parts. Service temperature: -65 to 400° F.
Retaining Compound 75	2000-4000	- - -	1-4	100-500	.003	Green	Bonding of parts to shaft, bearings, or threaded parts. Standard grade, fast cure. Service temperature: -65 to 400° F.
Bushing Mount	2000-5000	- - -	1-4	100-150	.003	Green	Retains bushings with slip fit. Bonds sintered bearings. Service temperature: -65 to 300° F.
Oil Seal Retainer	200-600	- - -	12-24	700-2000	.005	Purple	Flexible seal around outer case of shaft oil seals. Service temperature: -65 to 300° F.
Key Fit	500-1750	- - -	12-24	1000-3000	.005	Blue	Strengthens keys and fixed spline connections. Prevents backlash. Service temperature: -65 to 300° F.
Hydraulic Sealant	- - -	75-100	1-2	300-900	.003	Brown	Locks all hydraulic and pneumatic fittings up to 1-1/2" diameter. Service temperature: -65 to 300° F.
Refrigerant Sealant	1600-3400	750-1000	4-12	1000-3000	.003	Red	Seals all refrigerants. Locks fittings at any angle. Service temperature: -65 to 300° F.
Plastic Gasket	1600-3400	- - -	4-12	6000-7000	.003	Orange	Seals flange joints, replaces soft gaskets. Service temperature: -65 to 300° F.
Tube Sealant (Retaining Compound	3000-7000	- - -	12-24	2000-3000	.003	Green	Bonds and seals sleeve joints on aluminum, steel, and stainless steel tubing. Service temperature: -65 to 200°F.
Grade A	- - -	750-1000	2-6	10-15	.003	Red	To lock and seal fine threads. Service temperature: -65 to 300° F.
Anti-Seize Compound (Lubricant)	- - -	16 ft. lb. on 3/8"-24 Steel nuts and bolts	- -	- - -	- -	Silver	Protects metal joints from seizure, galling, and corrosion. Service temperature: -65 to 2000° F.

△ Locquic Primer may be used in connection with any of the materials called out in this table with the exception of the Anti-Seize Compound. The primer will decrease cure time of the sealant or compound.

Adhesive	Shear Strength PSI at RT	Cure Time at RT	Service Temperature	Color	Applications
Quick-Set 404 [1] [2] [3] [4]	2500-3500 [5]	55% Cure in 10 mins. Total Cure in 48 hrs.	-67 to 150° F. Intermittent to 175° F.	Clear	Bonds metals, plastics, rubber, and name plates.
Minute-Bond Adhesive 312 [6]	2600-3250 [5]	70% Cure in 2 mins. Full Cure in 10 days	-67 to 180° F.	Amber	Bonds metals, polyurethane, phenolics, nylon, epoxy glass, and ABS.

[1] 404 accelerator is recommended on plastics, passivated stainless, and anodized aluminum.

[2] 404 clean-up solvent will remove excess cured adhesive from around a bonded joint.

[3] Clearance between parts shall not exceed .0005".

[4] Not recommended for use in high humidity conditions.

[5] Shear values on phenolics, nylon, and ABS: 400 to 700 PSI. Rubber specimens fail before bond does.

[6] Do not use for rough-surface materials, irregularly mated surfaces, or in joints with clearances greater than .002".

Application of Loctite
Figure 1 (Sheet 2 of 2)

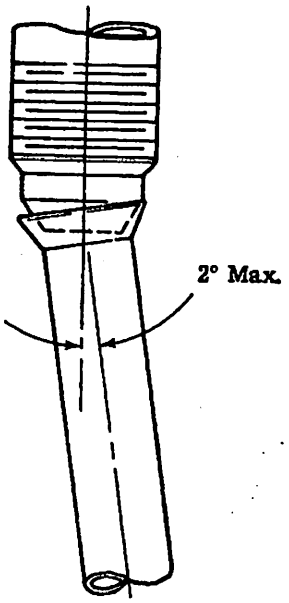
FLARED TUBING - MAINTENANCE PRACTICES

1. General
 - A. Flared tubing maintenance practices include removal/installation, inspection and fabricating.
 - B. From time to time, as inspection dictates or if damage occurs, it may be required to fabricate new flared tubing assemblies. This section outlines standard acceptable methods for fabricating flared tubing assemblies.
 - C. Whenever a tube has been damaged and needs replacing, the cause of the damage must be determined and corrected.
 - D. It is recommended that flared tubing be replaced and not repaired. When replacing aircraft tubing the replacement tubing must be of the same diameter, wall thickness and material as the old tube.
 - E. As a general rule, Learjet aircraft tubes are fabricated from either 5052-0, aluminum alloy, ASI 304 stainless steel or type 321 corrosion resistant steel. These tubes are usually fabricated from the following sizes of tubing: .500 O.D. x .035 wall, 500 O.D. x .065 wall, .375 O.D. x .049 wall, .250 O.D. x .035 wall and .750 O.D. x .035 wall. Additional tubing sizes may be found on the aircraft and it is imperative that the new tubing size matches the old tubing size.
 - F. When fabricating a new tube, the old tube, if not severely damaged, may be used as a template. If the old tube is too damaged for use as a template then a template can be made using soft iron wire.
 - G. All bends in the tubing are to start at a reasonable distance from the end of the tube. This allows the nut and sleeve to be slipped back far enough on the tube to facilitate flaring.
 - H. Tubing and fittings generally consist of an AN819 sleeve inside an AN818 nut. When assembling end fittings on a tube it is very important that dissimilar metals are not used. The use of dissimilar metals will cause corrosion. Assure that the correct fittings and sleeves are used.
 - I. Aliminum alloy tubing which is .375 outside diameter or less must be double flared. All other tubing shall be single flared.
 - J. Assure that only a 37^{O} aviation flare is used. The mistaken use of an automotive flare will give improper flare angle and shape, causing misfit, leakage, stress and probable failure.

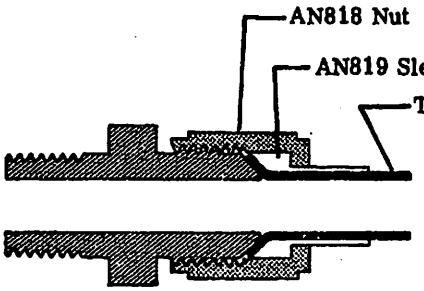
2. Removal/Installation
 - A. Remove Flared Tubing
 - (1) When removing flared tubing from the aircraft the tubing ends and related fittings must immediately be capped. When removing several tubes from the same area at one time it is helpful if the tubing ends are tagged.

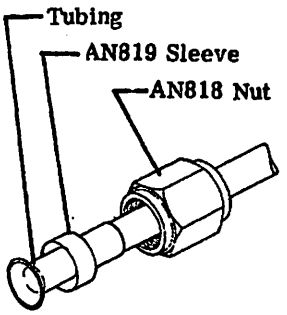
B. Install Tubing (See figure 201)
 (1) Check tubing for cleanliness and missing protective caps. Any tube which is missing a protective cap must be thoroughly cleaned.
 (2) Lubricate fitting threads with hydraulic fluid or apply thread tape if applicable.
 (3) With tubing in proper installation position, loosely connect fittings and clamps.
 (4) With clamps loose and without forcing tubing into alignment it must be possible to hand tighten nuts until tubing flare bottoms out against the fitting. If this cannot be done check alignment as follows:
 (a) Tighten, and lightly torque with a wrench, the nut on one end of the tubing.
 (b) Loosen the nut on the other end of the tubing and slide the nut down the tubing until the flare is clearly visible.
 (c) The tubing must be parallel within 2 degrees of the fitting.
 (d) The tubing must be in line with the fitting within 1/32 inch per 10 inches of tube length.
 (e) The tubing must match the fitting lengthwise within 1/32 inch per 10 inches of tube length.
 (f) If the tubing cannot be rebent to meet these requirements it must be replaced.
 (5) Tighten nuts to their specified torque value. (See figure 202)
 (6) Inspect tubing installation and assure that tubing minimum clearance is 3/32 inch of surrounding structure, adjacent tubings or fittings.
 (7) Assure that tubing has proper identification markings.

3. Inspection/Check
A. Inspect Tubing Prior to Installation as follows:
 (1) Replace any steel tubing which has a nick or scratch deeper than 10 percent of the tubing wall thickness.
 (2) Replace any aluminum tubing which has a nick or scratch deeper than 20 percent of the tubing wall thickness.
 (3) Replace any pressure or return line which has a dent deeper than 5 percent of the tubing outside diameter.
 (4) Replace any pressure or return line which has a dent in the heel of the bend radius deeper than 2.5 percent of the tubing outside diameter.
 (5) Replace any suction line which has a dent deeper than 10 percent of the tubing outside diameter.
 (6) Replace any suction line which has a dent in the heel of the bend radius deeper than 5 percent of the tubing outside diameter.
 (7) Replace any tubing which has evidence of the metal being stretched thin on the heel of the bend radius.



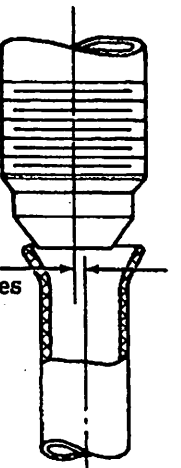
ANGULAR MISMATCH



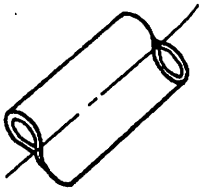


Measure mismatch with the free tube end clear of the fitting.

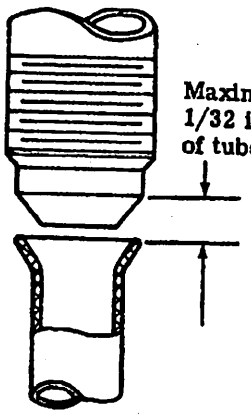
Maximum allowable: 1/32 inch per 10 inches of tube length.



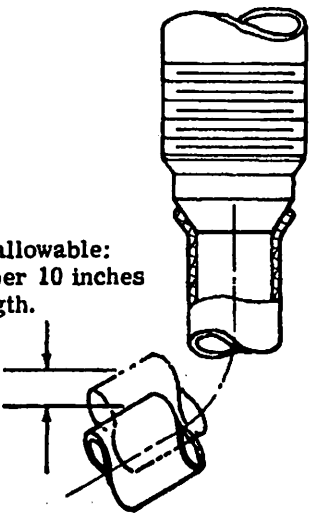
If necessary, push near the fixed end of the tube assembly so that the free end is clear.



RADIAL MISMATCH



If tube assembly is too short, measure the gap.



LENGTHWISE MISMATCH

If tube assembly is too long, either:
1. Remove the fitting, and measure the change in position of the free end; or
2. Push near the fixed tube end, and measure the distance to just unseat and free the flare.

Flared Tubing Installation
Figure 201

(8) Polish out burrs or scratches on the inside of the tubing flare. Begin with fine emery and oil and finish with crocus cloth and oil.
(9) Inspect flare and replace as indicated in figure 205.

4. Approved Repairs
A. Bend and Flare tubing as follows:
(1) Remove old or damaged tube from the aircraft in accordance with Removal/Installation.
(2) If the old tube is too damaged to use as a template, use soft iron wire and form into a shape which will match the fittings on the aircraft.

NOTE: Always select a path for tubing which will require bends in the tubing. Bends are necessary to relieve mechanical strain, permit temperature expansion and contraction and to absorb vibration.

(3) Determine the outside diameter, wall thickness and material of the old tube.
(4) Select a new piece of tubing with the same specifications as the old tubing.
(5) Cut the new tubing approximately 10% longer than the tube being replaced. This will provide for variations in bending.

NOTE: It is important, when cutting tubing, that the ends be cut square within 30 minutes to the centerline of the tube.

(6) Deburr the tube end. Exercise care that all burrs are removed and a minimum amount of material is removed.
(7) Using one of the following methods and tube bending data in figure 204, bend the new tubing to match the template.
(a) Hand bending without tools - This method is not recommended but may be used on tubing with an outside diameter of less than 1/4 inch. Mimimum bend radius table must be used as a guide. Bend tube carefully to avoid excessive flattening, kinking, or wrinkling. Slight flattening is acceptable if the flattened portion is not less than 75% of the original outside diameter.
(b) Hand bending with hand bender - To bend tubing with a hand tube bender similar to that shown in figure 203, proceed as follows. Insert tubing into bender by raising the slide bar handle as far as it will go. Hook clip over tube and assure that the full length of the slide bar groove is in contact with the tubing. With zero marks aligned, rotate handle until desired bend is obtained.

(c) Tube bending machine - Power tube bending machines are manufactured for all types of tubing. On large diameter and hard material tubing a power tube bender is necessary. Power bending machines work on the same principle as the hand bender.

NOTE: Tubes must be formed in such a manner so that when the tube is installed it will not have to be pulled or deflected into place by tightening the fitting.

(8) Slide the nut, followed by the sleeve, onto the end of the tube and move them down the tube far enough to allow for flaring.
(9) Using the appropriate flaring tool and the specification found in figures 205 thru 208 , flare the tube ends.

5. Cleaning/Painting

A. Newly fabricated tubing assemblies must be cleaned, capped and, if required, painted. Tubing which has been stored in unclean conditions must also be cleaned prior to installation.

B. Tubing cleaning equipment must consist of a metal tank with a solvent reservoir, a pump, a filtration unit (25 micron nominal) and a rack or screen which will prevent immersion of tubing into solvent. The pump nozzle must have a pressure high enough that it will remove chips, oil and other foreign matter from the tube.

TORQUE WRENCH LIMITS (INCH-POUNDS)

Tubing O. D. Inches	Tubing End Fittings			
	Aluminum Alloy Tubing - Flare MS33583 or MS33584		Steel Tubing - Flare MS33584	
	Minimum	Maximum	Minimum	Maximum
1/4	40	65	135	150
3/8	75	125	270	300
1/2	150	250	450	550
5/8	200	350	650	700
3/4	300	490	900	1000
1	500	700	1200	1400
1 1/4	600	900	----	----
1 1/2	600	900	----	----

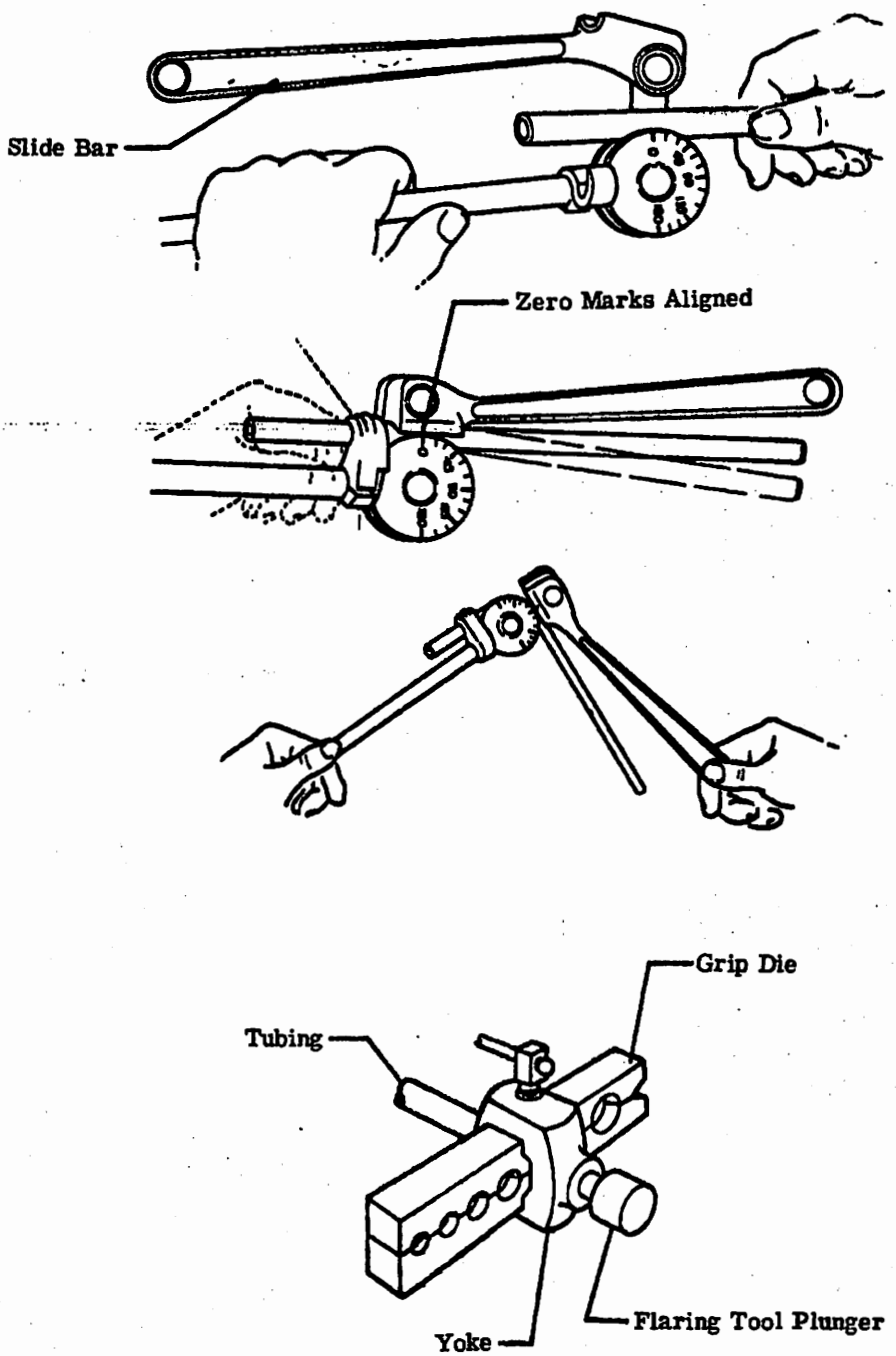
Tubing Torque Limits
Figure 202

C. New tubing should be painted the same as the old tubing. Usually, aluminum tubing located in the wheel well area and in the wet portion of the wing are painted with epoxy primer. Aluminum tubing located inside of structure is usually coated with zinc chromate primer. Stainless steel tubing requires no finish.

D. The interior surface of fire extinguisher and oxygen tubes shall be kept free of all finish.

E. Clean tubing as follows:
 (1) Thoroughly flush the outside and inside of the tubing. Assure that flare, nut, and sleeve are thoroughly cleaned.
 (2) Allow excessive solvent to drain from the tube.
 (3) Using clean, dry, compressed air, blow all remaining solvent from tube exterior, interior and fittings.
 (4) Immediately cap tubing using clean hardware.
 (5) Paint tubing if required.

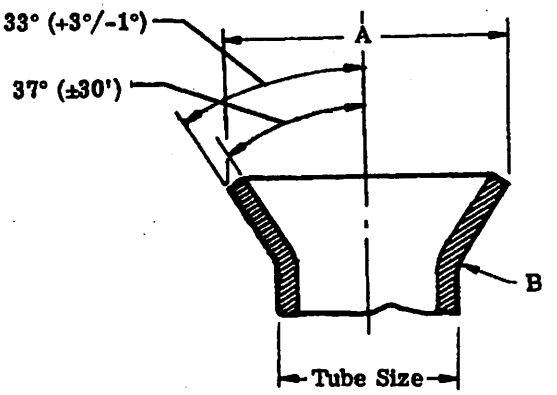
F. Paint tubing as follows:
 (1) With nut and sleeve both seated against the flare, mask 3/4 inch back from back face of nut.
 (2) Determine the type of finish which was on old tube. In most cases, the aluminum tubing will have been chemically cleaned and then chemical film treated followed by either zinc chromate or epoxy primer.



Tubing Fabrication Tools
Figure 203

TUBE OD	SPECIAL BEND RADII		RECOMMENDED BEND RADII		ADDITIONAL BEND RADII
	1-1/2 D	2 D	3D	4D	6D
1/8	.188	.250	.375	.500	.750
3/16	.281	.375	.563	.750	1.125
1/4	.375	.500	.750	1.000	1.500
5/16	.469	.625	.938	1.250	1.875
3/8	.563	.750	1.125	1.500	2.250
7/16	.656	.875	1.312	1.750	2.625
1/2	.750	1.000	1.500	2.000	3.000
5/8	.938	1.250	1.875	2.500	3.750
3/4	1.125	1.500	2.250	3.000	4.500
7/8	1.3125	1.750	2.625	3.500	5.250
1	1.500	2.000	3.000	4.000	6.000
1-1/8	1.688	2.250	3.375	4.500	6.750
1-1/4	1.875	2.500	3.750	5.000	7.500
1-3/8	2.063	2.750	4.125	5.500	8.250
1-1/2	2.250	3.000	4.500	6.000	9.000
1-5/8	2.438	3.250	4.875	6.500	9.750
1-3/4	2.625	3.500	5.250	7.000	10.500
1-7/8	2.813	3.750	5.625	7.500	11.250
2	3.000	4.000	6.000	8.000	12.000
2-1/4	3.375	4.500	6.750	9.000	13.500
2-1/2	3.750	5.000	7.500	10.000	15.000
3	4.500	6.000	9.000	12.000	18.000

Tube Bending Data
Figure 204



TUBE SIZE NOMINAL OD	A DIA AL ALLOY TUBING		A DIA STEEL TUBING		B ±.010 RAD
1/8	.200		.200		
3/16	.302		.302		.032
1/4	.359		.359		
5/16	.421	+.000	.421	+.000	
3/8	.484	-.010	.484	-.010	.046
1/2	.656		.656		
5/8	.781		.781		.062
3/4	.937		.937		.078
1	1.187		1.187		
1-1/4	1.500		1.500		.093
1-1/2	1.721	+.000	1.721	+.000	
1-3/4	2.106	-.015	2.106	-.015	
2	2.356		2.356		.109
2-1/2	2.856		2.856		
3	3.356		3.356		

Single Flare Specifications
Figure 205



EXTRUDED FIN

Wedge raised above surface of flare. Two marks diametrically opposite.

Caused by worn throat on clamping die.

BASIS FOR REJECTION as it prevents sleeve from seating properly.



CRACKED FLARE

Cracks usually longitudinal in flared portion.

Caused by too great an eccentric setting on rotary mandrel. Too much pressure on ram mandrel. Flaw in material.

NOT ACCEPTABLE.



ANGLED/ECCENTRIC FLARE

Flare is eccentric with tube. Tip not perpendicular to center line of tube. Thickness of flare varies.

Caused by loose clamping or mandrel or dies out of alignment. Also angle cut tube.

NOT ACCEPTABLE.



ROUGH EDGE

Lip of flare has jagged or uneven edge.

Caused by improper cutting or burring or too much mandrel pressure.

NOT ACCEPTABLE.



DIE CREASE

Slight longitudinal fin along flare or tube.

Caused by slightly larger than nominal tube.

Crease must not be more than .004" high on flare.

ACCEPTABLE IF sleeve passes freely onto flare.



SCRATCHES/GROOVES - INTERNAL ANGULAR

Marks approximately parallel to flare lip.

Caused by metal chip pickup on mandrel.

ACCEPTABLE UNLESS depth exceeds 10% of flare thickness.

Single Flare Acceptance Limits
Figure 206 (Sheet 1 of 2)



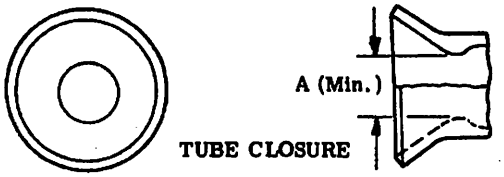
SCRATCHES/GROOVES - INTERNAL LONGITUDINAL OR SPIRAL

Marks perpendicular or spiralling to flare tip.

Caused by scored mandrel or metal chip pickup.

NOT ACCEPTABLE IF marks are on outer 30% of flare.

ACCEPTABLE IF marks are on inner 70% of flare and depth does not exceed 10% of flare thickness.



TUBE CLOSURE

Tube ID decreased by flaring.

Caused by too great an eccentric on rotary mandrel.

ACCEPTABLE IF ID is not smaller than dimension below.

TUBE SIZE	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
A MIN.	.049	.112	.150	.221	.284	.378	.471	.508	.820

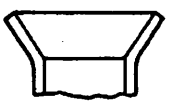


CLAMPING DIE MARKS

Small irregular marks in clamping area of tube.

Caused by die clamps.

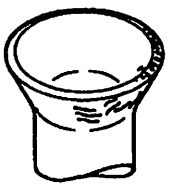
ACCEPTABLE IF depth does not exceed 5% of wall thickness.



SHARP INNER EDGE

Sharp edge at junction of inner flare and tube diameter.

ACCEPTABLE.



ABRASIVE SCRATCHES

Smooth abrasive area on flare tip.

Caused by cleanup polishing.

ACCEPTABLE IF depth does not exceed 5% of wall thickness.



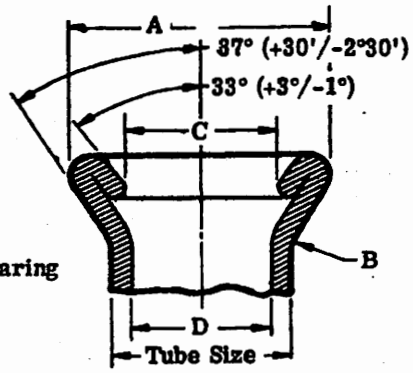
SCRATCHES/DINGS

Scratches or dings on tubing and/or flare surface.

Caused by storing and handling.

ACCEPTABLE IF depth does not exceed 5% of wall thickness.

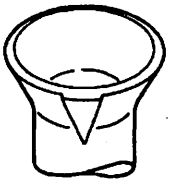
Single Flare Acceptance Limits
Figure 206 (Sheet 2 of 2)



Break Corners Prior to Flaring

TUBE SIZE NOMINAL OD	A +.000 -.010 DIA	B RAD ±.010	C DIA		D DIA REF	WALL THICKNESS
			MAX	MIN		
1/8	.200	.032	.096 .086	.062 .048	.062 .048	.028 .035
3/16	.302		.168 .158	.124 .110	.124 .110	.028 .035
1/4	.359		.230 .219	.187 .173	.187 .173	.028 .035
5/16	.421		.281 .259	.235 .205	.235 .205	.035 .049
3/8	.484	.046	.354 .344 .322	.312 .298 .268	.312 .298 .268	.028 .035 .049

Double Flare Specifications
Figure 207

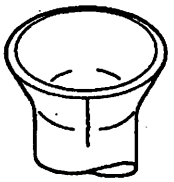


EXTRUDED FIN

Wedge raised above surface of flare. Two marks diametrically opposite.

Caused by worn throat on clamping die.

BASIS FOR REJECTION as it prevents sleeve from seating properly.



DIE CREASE

Slight longitudinal fin along flare or tube.

Caused by slightly larger than nominal tube.

Crease must not be more than .004" high on flare.

ACCEPTABLE IF sleeve passes freely onto flare.



SCRATCHES/GROOVES - INTERNAL ANGULAR

Marks approximately parallel to flare lip.

Caused by metal chip pickup on mandrel.

ACCEPTABLE UNLESS depth exceeds 10% of flare thickness.



SCRATCHES/GROOVES - INTERNAL LONGITUDINAL OR SPIRAL

Marks perpendicular or spiralling to flare lip.

Caused by scored mandrel or metal chip pickup.

NOT ACCEPTABLE IF marks are on outer 30% of flare.

ACCEPTABLE IF marks are on inner 70% of flare and depth does not exceed 10% of flare thickness.

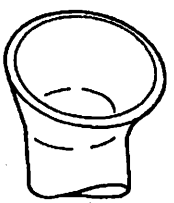


CRACKED FLARE

Cracks usually longitudinal in flared portion.

Caused by too great an eccentric setting on rotary mandrel. Too much pressure on ram mandrel. Flaw in material.

NOT ACCEPTABLE.



ANGLED/ECCENTRIC FLARE

Flare is eccentric with tube. Tip not perpendicular to center line of tube. Thickness of flare varies.

Caused by loose clamping or mandrel or dies out of alignment. Also angle cut tube.

NOT ACCEPTABLE.

Double Flare Acceptance Limits
Figure 208 (Sheet 1 of 3)



CLAMPING DIE MARKS

Small irregular marks in clamping area of tube.

Caused by die clamps.

ACCEPTABLE IF depth does not exceed 5% of wall thickness.



ABRASIVE SCRATCHES

Smooth abrasive area on flare tip.

Caused by cleanup polishing.

ACCEPTABLE IF depth does not exceed 5% of wall thickness.



SCRATCHES/DINGS

Scratches or dings on tubing and/or flare surface.

Caused by storing and handling.

ACCEPTABLE IF depth does not exceed 5% of wall thickness.



EXTRUDED FLARE

Flare extends into ID of tube.

Caused by tube being too far out of clamping die before flaring. Too much pressure. Cone mandrel without stop.

ACCEPTABLE IF flare does not extend past minimum tube ID.



INDENTATION - INNER TUBE

Mark on tube ID below flare.

Caused by second operation pilot when mandrel is misaligned with clamping die.

NOT ACCEPTABLE.



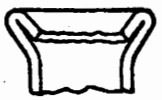
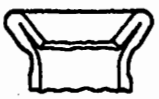
FLATTENED LIP

Flattened or ringed flare outer lip.

Caused by various machine settings.

ACCEPTABLE PROVIDING flare is perpendicular to tube center line and is not cracked at bend.

Double Flare Acceptance Limits
Figure 208 (Sheet 2 of 3)

 THIN FLARE	Flare thickness unusually thin. Caused by cone mandrel without stop. ACCEPTABLE IF thickness "T" is not less than 1.5 times tube wall thickness.
 VARYING FLARE THICKNESS	Flare thickness varies. Caused by die misalignment. ACCEPTABLE IF variation does not exceed .004.
 WAVY EDGE	Uneven flare inner edge. Caused by tooling variables. ACCEPTABLE IF flare does not extend past minimum tube ID.
 SLEEVE INDENTATION	Tube indented at outside base of flare. Caused by worn tooling. ACCEPTABLE IF indentation is not more than 12% of nominal thickness.

Double Flare Acceptance Limits
Figure 208 (Sheet 3 of 3)

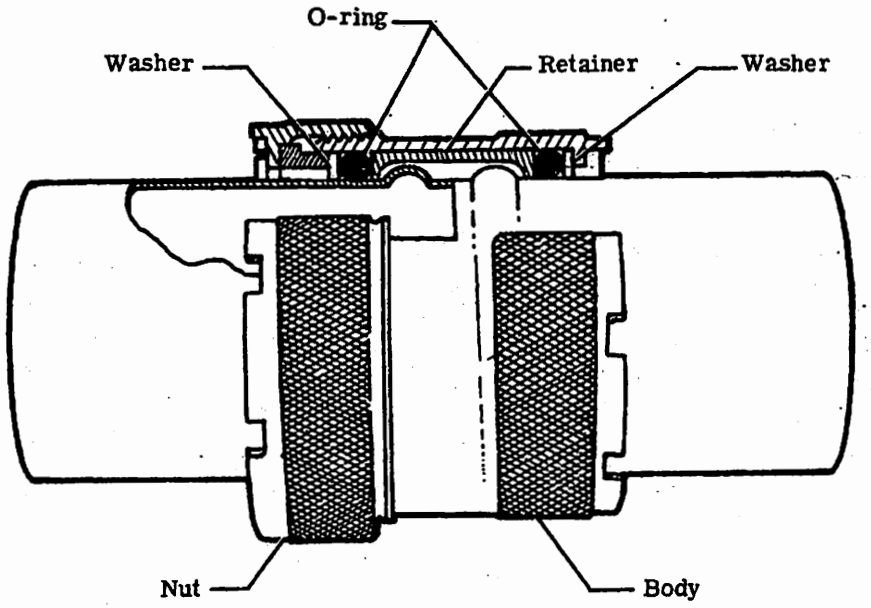
WIGGINS CONNECTORS - MAINTENANCE PRACTICES

1. General
 A. Wiggins connectors are used in the fuel and bleed air systems.
 B. Connectors which are sealed with silicone O-rings are tightened hand tight only.

2. Removal/Installation
 A. Install Wiggins Connector (See figure 201)
 (1) Slide body over one tube end and nut over its mating tube end.
 (2) Install washer on each tube end.
 (3) Lubricate and install the proper O-rings on each tube end.

 NOTE: Connectors used in the fuel system have MS29513 O-rings and are to be lightly lubricated with petrolatum (VV-P-236) prior to installation.
 Connectors used in the bleed air system have silicone O-rings and are to be lightly lubricated with silicone lubricant prior to installation.

 (4) With nut, body, washers and O-rings slid down the tubes far enough to expose tube ends, install retainer over mating tube ends.
 (5) Slide nut and body into position. Carefully align tube and connector. Angular mismatch is not to exceed 4° and radial mismatch is not to exceed 1/16 inch. The gap between the tubes is to be 0.13 (±.03) inch for fuel system and 0.19 (±.03 inch for the bleed air system. After aligning tubes and connector, engage threads and tighten hand tight.
 (6) Connectors which are sealed with silicone O-rings are to be tightened hand tight only. Connectors which are sealed with MS29513 O-rings must be torqued per figure 202. Torquing of applicable connectors is accomplished with a spanner adapter attached to the torque wrench.
 (7) After connectors have been properly tightened, safety wire using double twist method.



Wiggins Connector Installation
Figure 201

Connector Size	Torque Value In.-Lbs.		Connector Size	Torque Value In.-Lbs.	
	Min.	Max.		Min.	Max.
-12D	60	85	-40D	385	420
-16D	125	155	-48D	705	740
-20D	185	215	-56D	925	960
-24D	325	360	-64D	1045	1080
-28D	350	385	-72D	1165	1200
-32D	360	395	-80D	1285	1320

NOTE: Torque values are for connectors sealed with MS29513 O-rings. Silicone O-ring sealed connectors are hand tight only.

Wiggins Connector Torque Values
Figure 202

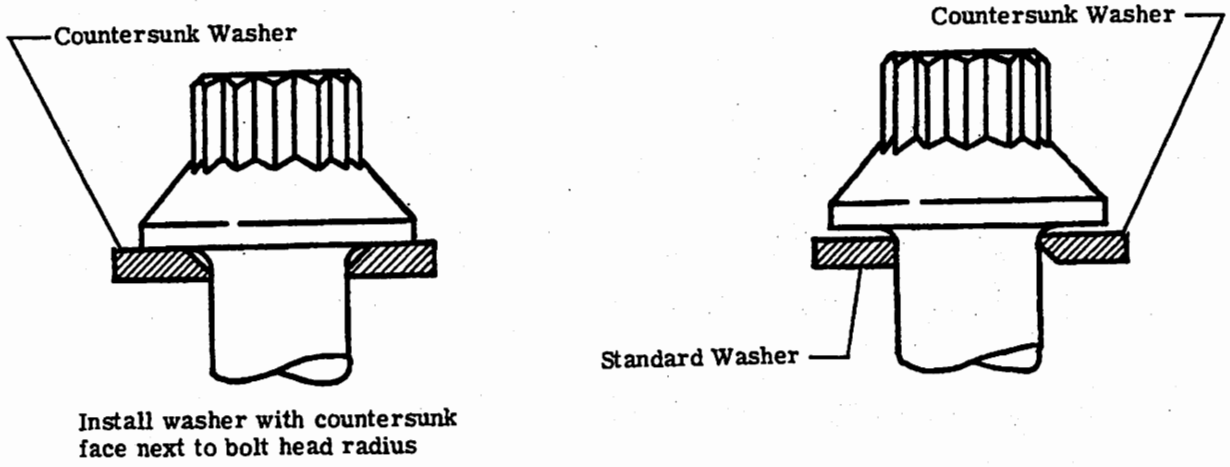
BOLT TORQUE DATA - MAINTENANCE PRACTICES

1. General
 A. Torquing of bolts is required to provide security of installation and prevent overstressing of components during installation.
 B. Special torque values for specific installations are given in maintenance practices and installation instructions of the various components.
 C. Torquing is not required for bolts, nuts, and screws installed in the control systems or other installations where torque would interfere with proper operation of parts. On such applications, the assembly shall be firm, but not tight enough to cause binding.
 D. When drag torque is referred to it is defined as the torque required to turn a self-locking nut on the threads of a bolt. Drag torque is normally added to the required torque value.
 E. When shank friction is referred to it is defined as the torque required to turn a bolt within a snugly fitting hole. Shank friction is normally added to the required torque value.

2. Removal/Installation
 A. Install Bolts
 (1) Bolts 1/4 inch diameter or less which are drilled for cotter pins should not be installed using self-locking nuts.
 (2) When installing bolts, assure that the threads are free of foreign material. Do not use anti-seize compounds or lubricants unless specified in the specific instructions.
 B. Install Nuts
 (1) When installing castellated nuts for use with safety wire or cotter pin, align holes by tightening nut to low torque range and continue to tighten until holes align. If holes cannot be aligned without exceeding the maximum torque value, a washer of different thickness may be used or another washer added.
 (2) When installing self locking nuts always use the same type nut as removed. Self-locking nuts should not be substituted for castellated nuts secured by safety wire or cotter pin. Fiber or nylon self-locking nuts should not be used in areas subject to high temperature.
 C. Install Washers (See figure 201)
 (1) When installing a lockwasher against aluminum alloy, a cadmium plated flat washer should be installed between lock washer and aluminum alloy to prevent damage to the aluminum alloy. On magnesium alloys use a NAS1252 flat washer under the lockwasher to prevent corrosion between dissimilar metals.
 (2) The use of wrong type or number of washers can result in improper preloading of the bolts when torqued.
 (3) When bolts are used which have a radius under bolt head, a

countersunk washer must be used with the countersink next to the radius under the bolt head. Reversing a countersunk washer or installing a standard washer can result in bolt failure.

3. Inspection/Check
 A. Inspect Nuts and Bolts
 (1) Bolts should extend through the self-locking portion of self-locking nuts. Rounded or chamfered ends should extend at least full round or chamfer through nut. Flat end bolts should extend at least 1/32 inch through nuts.
 (2) Drilled hole in bolts for use with castellated nuts should not extend more than 1/2 diameter of hole above nut.
 (3) When reusing self-locking nuts, assure that gripping power is sufficient so as not to loosen in service. Nuts which thread onto bolt easily should be discarded. To determine if gripping power is sufficient, screw nut onto bolt until three threads are exposed. Attach a torque wrench to nut and unscrew, gripping power must be above minimum torque value specified in figure 202.



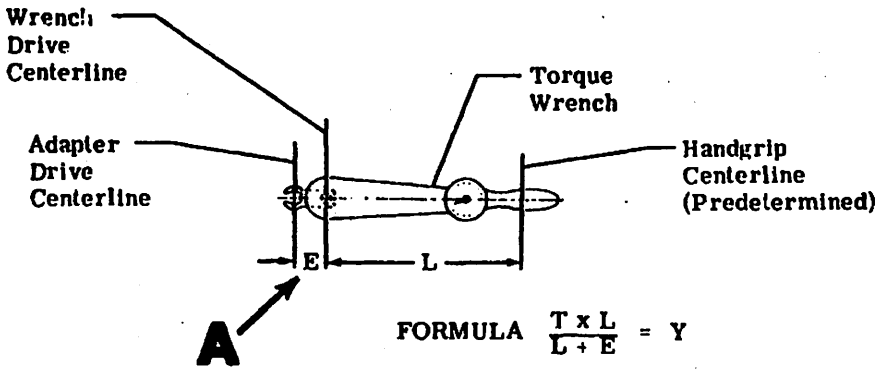
Washer Installation
Figure 201

4. Using Torque Wrenches (See figure 203)
 A. The following standard torque wrench practices should be followed when torquing nuts and bolts.
 (1) Whenever possible the nut should be torqued. When it is necessary to torque the bolt head the bolt should be torqued to the high torque value plus shank friction, if any.
 (2) Calibrate torque wrenches periodically to assure accuracy.
 (3) Take final torque reading while nut is rotating. If highest torque value is reached without rotating the nut, the nut must be backed off and retorqued.
 (4) When torquing requires the use of an adapter, the torque value must be computed using figure 203.

BOLT SIZE	MINIMUM BREAKAWAY TORQUE VALUE
8-32	1.5 Inch-Pounds
10-32	2.0 Inch-Pounds
1/4-28	3.5 Inch-Pounds
5/16-24	6.5 Inch-Pounds
3/8-24	9.5 Inch-Pounds
7/16-20	14.0 Inch-Pounds
1/2-20	18.0 Inch-Pounds
9/16-18	24.0 Inch-Pounds
5/8-18	32.0 Inch-Pounds
3/4-16	50.0 Inch-Pounds
7/8-14	70.0 Inch-Pounds
1-14	92.0 Inch-Pounds

NOTE: Replace nuts which fall below values shown for unscrewing nut from bolts.

Torque Values for Self-Locking Nuts
Figure 202



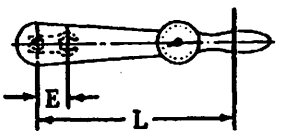
FORMULA $\frac{T \times L}{L + E} = Y$

EXAMPLE (WITH "E" AS PLUS DIMENSION)

T = 135 IN. LB
Y = UNKNOWN
L = 10.0 IN.
E = 1.5 IN.

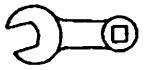
$Y = \frac{135 \times 10}{10 + 1.5} = \frac{1350}{11.5} = 117.39$

Y = 117 IN. LB



Detail A

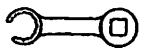
NOTE: If it is necessary to attach adapter drive 180° as shown in Detail A, then 'E' becomes a negative number.



Open-End Wrench Adapter



Short Open End Adapter



Flare Nut Wrench Adapter



Spanner Wrench Adapter



Setscrew Adapter



Hose Clamp Adapter

Torque Wrench Adapter Formulas
Figure 203 (Sheet 1 of 2)

Approx. Length of Torque Arm	Adapter Lengths						
	1" thru 1-5/8"	Over 1-5/8" thru 2-3/8"	Over 2-3/8" thru 3-1/8"	Over 3-1/8" thru 3-7/8"	Over 3-7/8" thru 4-5/8"	Over 4-5/8" thru 5-3/8"	Over 5-3/8" thru 6
7"	.85	.77	.71	.66	.61	.57	.54
9-1/2"	.89	.83	.78	.74	.69	.67	.64
13-1/2"	.91	.87	.83	.79	.76	.73	.70
24"	.95	.92	.90	.87	.85	.83	.81

NOTE: Multiply the required torque by the decimal figures given in this table to obtain the actual wrench reading.

Conversion Torque Data for Use with Universal Sockets

To Obtain a Torque of	Dial Must Read - With Universal Held at These Angles						
In. or Ft. Lbs.	10°	20°	30°	40°	45°	50°	60°
10	10.2	10.7	11.5	13.1	14.1	15.6	20.0
20	20.4	21.4	23.0	26.2	28.2	31.2	40.0
30	30.6	32.1	34.5	39.3	42.3	46.9	60.0
40	40.8	42.8	46.0	52.4	56.4	62.4	80.0
60	61.2	64.2	69.0	78.6	84.6	93.6	120.0
80	81.6	85.6	92.0	104.8	112.8	124.8	160.0
100	102.0	107.0	115.0	131.0	141.0	156.0	200.0
120	122.4	128.4	138.0	157.2	169.2	187.2	240.0
140	142.8	149.8	161.0	183.4	197.4	218.4	280.0
180	183.6	192.6	207.0	235.8	253.8	253.8	360.0
200	204.0	214.0	230.0	262.0	282.0	312.0	400.0
220	224.4	235.5	243.0	288.2	310.2	243.5	440.0
240	244.4	256.8	276.0	314.4	338.4	374.4	480.0
260	265.2	278.2	299.0	340.6	366.6	405.6	520.0
280	385.6	299.6	312.0	366.8	394.8	436.8	560.0
300	306.0	321.0	345.0	392.0	423.0	468.0	600.0
320	326.4	342.4	368.0	419.2	451.2	499.2	640.0
340	346.8	363.8	391.0	445.4	479.4	530.4	680.0
360	367.2	385.2	414.0	471.6	507.6	561.6	720.0
380	387.6	406.6	437.0	497.8	535.8	592.8	760.0
400	408.0	428.0	460.0	524.0	564.0	624.0	800.0
420	428.4	449.4	483.0	550.2	602.2	655.0	840.0
440	448.8	470.8	506.0	576.4	620.4	686.4	880.0
460	469.2	492.2	529.0	593.6	648.6	717.6	920.0
480	489.6	512.6	552.0	628.8	676.8	748.8	960.0
500	510.0	535.0	575.0	655.0	705.0	780.0	1000.0

Torque Wrench Adapter Formulas
Figure 203 (Sheet 2 of 2)

TORQUE WRENCH TOLERANCES

(Inch-Pounds)			
Applied Torque	Tolerance	Applied Torque	Tolerances
5	4 - 6	350	340 - 363
10	9 - 11	400	388 - 414
15	14 - 16	450	437 - 465
20	19 - 23	500	485 - 517
25	24 - 28	600	582 - 620
30	29 - 33	700	679 - 723
40	39 - 43	750	728 - 775
50	49 - 54	800	776 - 826
60	58 - 64	900	873 - 929
70	68 - 74	1000	970 - 1032
80	78 - 84	1100	1067 - 1135
90	87 - 95	1200	1164 - 1238
100	97 - 105	1300	1261 - 1341
125	121 - 131	1400	1358 - 1444
150	146 - 157	1500	1455 - 1547
200	194 - 208	1600	1552 - 1650
250	243 - 260	1700	1649 - 1753
300	291 - 311	1800	1746 - 1856

NOTE: Tolerances for ft-lbs shall be plus or minus 3% plus 2 ft-lbs for all ranges.

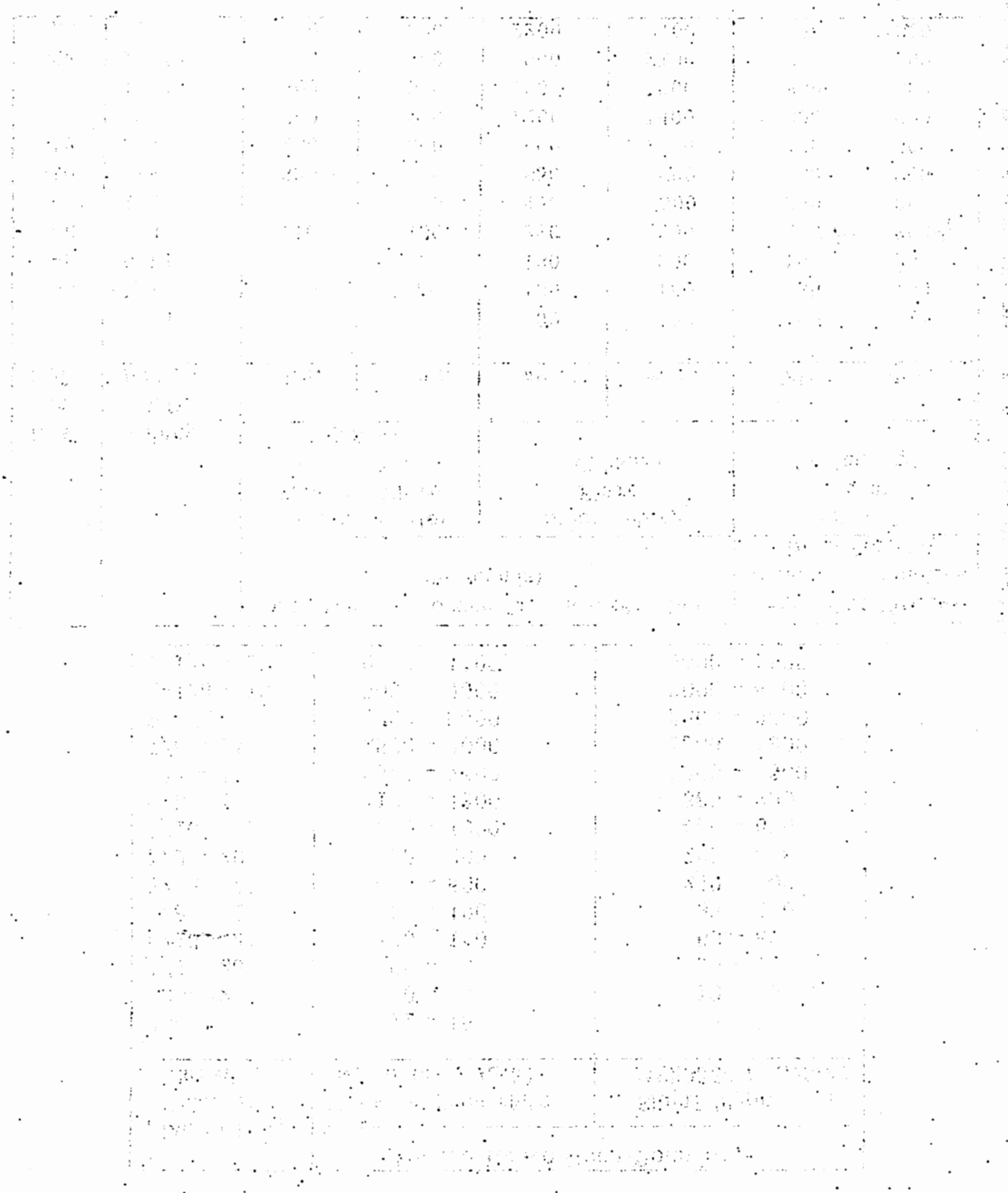
Torque Wrench Tolerances
Figure 204

Size of Nut, Bolt, or Screw	Torque Range (Inch-Pounds)	
	Tension Type Nuts MS20365 & AN310	Shear Type Nuts MS20364 & AN320
8 - 32	12 - 15	7 - 9
10 - 32	20 - 25	12 - 15
1/4 - 28	50 - 70	30 - 40
5/16 - 24	100 - 140	60 - 85
3/8 - 24	160 - 190	95 - 110
7/16 - 20	450 - 500	270 - 300
1/2 - 20	480 - 690	290 - 410
9/16 - 18	800 - 1000	480 - 600
5/8 - 16	1100 - 1300	660 - 780
3/4 - 16	2300 - 2500	1300 - 1500
7/8 - 14	2500 - 3000	1500 - 1800
1 - 14	3700 - 5500	2200 - 3300
1-1/8 - 12	5000 - 7000	3000 - 4200
1-1/4 - 12	9000 - 11000	5400 - 6600

Dash No. Ref.	Tubing O.D. Inches	Instl. Wrench Torque Limits AN818 Nut (Inch-Pounds)				Hose End Fittings & Hose Assemblies (Inch-Pounds)	
		Aluminum Alloy Tubing - Flare MS33583 or MS33584		Steel Tubing Flare MS33584		MS24587 or Equiv. Fitting End	
		Min.	Max.	Min.	Max.	Min.	Max.
-3	3/16	-	-	90	100	90	100
-4	1/4	50	65	135	150	135	150
-5	5/16	70	90	180	200	180	200
-6	3/8	110	130	270	300	270✱	300✱
-8	1/2	230	260	450	500	230	260
-10	5/8	330	360	650	700	330	360
-12	3/4	460	500	900	1000	460	500
-16	1	600	700	1200	1400	600	700
-20	1-1/4	800	900	1500	1700	800	900
-24	1-1/2	800	900	1900	2100	800	900
-32	2	900	1300	2200	2700	900	1300

✱ Use 270-300 inch-pounds torque if the fitting end is black. If the fitting end is a color other than black, use 110-130 inch-pounds torque.

Torque Values
Figure 205



EXTERIOR PAINT - MAINTENANCE PRACTICES

1. Preparation of Aircraft for Painting

NOTE:
- Exterior paint maintenance practices cover the preparation and repair of exterior painted surfaces of the airplane.
- When repairing aircraft painted surfaces, be sure to use same type paint and its applicable thinners and solvents which were previously applied.
- The paint manufacturer's name, and paint number, are usually entered in the airplane logbook. If it is not, contact the Learjet factory, Marketing Interiors Department, Tucson, Arizona.
- ALUMIGRIP polyurethane enamel paint is used extensively; therefore, the procedures below list repair and application of ALUMIGRIP paint.
- Spray type paint strippers shall be used within six months of date of manufacture and be certified as meeting the corrosion and hydrogen embrittlement requirements of TT-R-248.

A. Tools and Equipment

NOTE: Equivalent substitutes may be used in lieu of the following items.

NAME	NUMBER	MANUFACTURER
Vinyl Film	3470	3M Company
Vapor Proof Masking Tape		Commercially Available
Vapor Proof Masking Paper		Commercially Available
Vinyl Tape (Black)	471	3M Company
Protex Tape (Elephant Hide)	20V	
Abrasive Paper (AL. Oxide)	180 grit or finer	Commercially Available
Aluminum Foil Tape	No. 425	3M Company
Abrasive Pads (Nylon Wool)	Type A	Scotch Brite
Methyl Ethyl Ketone (MEK)	TT-M-261	Commercially Available
Toluol	TT-T-548	Commercially Available
Lacquer Thinner	TT-T-266	Commercially Available
Aluminum Tape (Mystic)	7453	Carbon Shippers Supply Wichita, Kansas
Plastic Tape	226	3M Company
Clean Rags (Cotton, Lint-free)		Commercially Available
Cheesecloth		Commercially Available

NAME	NUMBER	MANUFACTURER
Wheel Brush	Anderson DM3-22363 -B022320 or equivalent	Vic DeWitt Co., Inc.
Sander	Model DA-Q or equivalent	National Detroit, Inc. Rockford, Illinois
Thickness Gage (Digital)	Nova Model 201	
Air Motor (11000 RPM)	10L2752C01	Dotco Inc. Hinksville, Ohio
Polywrap Paper	MIL-B-121C, Grade A, Type 2, Class I	Commercially Available
Bag Sealer	41-3371	Prestite Div. of Interchemical Corp., St. Louis, Missouri
Vacuum Sealant	5240-4	Fiber Resin Corp. Warren, Michigan
Cleaner	No. 10	Turco Products Inc. Wichita, Kansas
Cleaner	754H	Pennwalt Chemicals Dallas, Texas
Stripper	2277-N-22	Pennwalt Chemicals Dallas, Texas
Stripper	5551	Turco Products Inc. Wichita, Kansas
Stripper	739A	Pennwalt Chemicals Dallas, Texas
Barrel Pump (Braco)	3.5 to 1 ratio (Stainless Steel)	Turco Products Inc. Wichita, Kansas
Barrel Pump (Ball-Crank)	3.5 to 1 ratio (Stainless Steel)	Pennwalt Chemicals Dallas, Texas
Hose (50 feet)	(High pressure, approved for paint strippers)	Commercially Available
Spray Wand	(6' long 3/8" I.D. with cut-off valve and 45° spray tip)	Commercially Available
Brushes (Stiff Nylon or Pure Bristle)		Commercially Available

NAME	NUMBER	MANUFACTURER
Rinse Gun (Air-Water)	(Pistol grip rinse gun that mixes air & water)	Commercially Available
Rubber Gloves (Neoprene Tight Fitting - Non-Slip)		Commercially Available
Rubber Boots (Neoprene, below the knee length)		Commercially Available
Face Shields and Helmet (Acid Wear)	15536 (Wheeler)	Mid-Continent Fire & Safety Co. Wichita, Kansas
Aprons (Acid Type)	64-30 (Sawyer)	Mid-Continent Fire & Safety Co. Wichita, Kansas
Squeegee	12" Lightweight	Commercially Available
Scrub Brush (Teflon)	6" Long Handle	Commercially Available

B. Paint Removal

CAUTION: THE MAXIMUM ALLOWABLE BASE METAL REMOVAL DURING MECHANICAL SANDING SHALL NOT EXCEED 0.002 INCH.

NOTE:
- Paint stripping shall be done in a well ventilated area.
- Stripping efficiency is very poor at temperatures below 65°F.
- Safety equipment (face-shield and helmet, apron, rubber gloves, and rubber boots) shall be worn by personnel using spray paint strippers.
- Avoid using paint strippers over six months old as they may be defective.

(1) Cut a piece of polywrap paper approximately one-half inch smaller than window or windshield being masked.

(2) Attach paper to window or windshield with plastic tape, with outer edge of tape barely touching metal around window. Roll or press edges of tape down to assure complete contact.

(3) Wash area around window thoroughly with Methyl Ethyl Ketone (MEK) or equivalent.

(4) Apply another piece of polywrap paper, cut to size of window or windshield. Using plastic tape, allow at least 1/4 inch overlap of tape onto the metal around window or windshield.

(5) Rub all edges of plastic tape to assure complete contact.

(6) Apply aluminum tape over plastic tape, overlapping 1/4 inch.

(7) Using polywrap paper and plastic tape, mask all engines, antennas, landing gear, pitot heads, rubber materials, wiring, and fiberglass parts.

NOTE: Lap masking materials in a manner that will shed stripper and not collect it.

(8) Plug all tooling holes and openings with cork or suitable materials that resist stripper.

(9) Apply stripper as follows:

CAUTION:
- AVOID APPLYING STRIPPER HEAVY ENOUGH TO RUN OFF AIRCRAFT.
- ALWAYS APPLY STRIPPER IN A MANNER THAT WILL NOT REQUIRE OPERATOR TO WALK IN DROP-OFF MATERIAL.
- SHOULD STRIPPER ACCIDENTALLY CONTACT SKIN, FLOOD AREA WITH WATER AND IF BURNING OCCURS, CONTACT FIRST AID.

(a) Apply stripper to bottom side of wings and fuselage.

(b) Apply stripper to aircraft starting at top aft end and work forward.

(c) Allow stripper to set on aircraft until paint has blistered and lifted (approximately 15 to 20 minutes).

(d) Starting at tip of aircraft and using a squeegee, remove loose paint and stripper. Reapply stripper to paint that is still tight. After paint is loose, remove paint and stripper.

(e) Rinse aircraft with high pressure and high volume water, brushing surface with soft bristle push-type brush.

CAUTION: AVOID DIRECTING STREAM OF RINSE WATER AT THE EDGES OF MASKING MATERIALS AS THE HIGH PRESSURE MAY LIFT TAPE.

(f) After aircraft has been thoroughly rinsed, remove all masking materials.

(g) Remove paint that was under masking tape by applying stripper with a small brush or sanding with 180 or finer grit sandpaper.

(h) Wash aircraft with Methyl Ethyl Ketone or equivalent. Wipe MEK off aircraft with soft cotton cloth.

(i) Apply cleaner (Turco Airtec No. 10 or equivalent) to aircraft by spraying or mopping. Allow cleaner to soak for 10 minutes.

NOTE: The cleaner (Turco Airtec No. 10 or equivalent) shall be mixed 1 part cleaner to 5 gallons water.

(j) Rinse aircraft with high pressure and high volume water.
(k) Remove paint from non-metallic surfaces by sanding with 180 or finer aluminum oxide abrasive paper.

CAUTION: DO NOT SAND INTO THE FIBER REINFORCEMENT IN THE NON-METALLIC MATERIAL.

(10) Inspect aircraft for the following:
(a) Entire aircraft including windshield and windows for damage.
(b) Complete removal of paint. Remove any residual paint with 180 grit or finer sandpaper.
(c) Skin joints for integrity and smoothness of sealant application.
(d) Repair any deterioration or substandard sealant application. (Refer to "Sealants - Description and Operation", 20-10-00.

(11) Mask aircraft for painting as follows:
(a) Mask windshield with precut Protex paper and cover paper with vinyl film, securing edges of film to aircraft with black vinyl tape.
(b) Mask windows with precut vinyl film and cover edges with black vinyl tape.
(c) Using vapor-proof masking material and black plastic tape, mask the engines, intakes, main and nose landing gear, antenna, horizontal stabilizer anti-ice blanket, and pitot mast.
(d) Plug all air vent system openings on wings, fuselage, and tip tanks using vapor-proof masking material and black plastic tape.
(e) Mask recognition lights, anti-collision beacons, navigation lights, and static ports.

(12) Prepare fiberglass surfaces as follows:
(a) Mask off to protect surfaces around work area using vapor-proof material and black plastic tape.
(b) Thoroughly scrub surface with Methyl Ethyl Ketone solvent or equivalent and clean cotton cloth. Remove all traces of previously applied coatings and markings.
(c) Remove solvent while still wet with a stub bristle brush. Use high pressure air to remove solvent from recesses.

NOTE:
- Always wash towards or parallel to taped edge of masked area.
- DO NOT wash from taped surface toward adjacent surfaces which are to be painted.

(d) Use abrasive paper 180 grit or finer or Scotch-Brite pads. Lightly abrade fiberglass surface.

(e) Clean abraded area using Methyl Ethyl Ketone. Remove solvent while still wet with clean, lint-free cotton cloth.

(f) Apply sanding primer to abraded area.

(g) After primer has cured, scuff sand with abrasive paper 400 grit or finer.

(h) After sanding, verify there is no pin holes in primer.

NOTE: On fiberglass surfaces in airstream having an exposed surface area of 0.5 square feet or larger, an anti-static conductive coating must be applied before paint is applied.

(i) Apply conductive coating to required fiberglass area. (Refer to "Conductive Coating Maintenance Practices," 20-52-00.)

2. Painting

A. Tools and Equipment

NOTE: Equivalent substitutes may be used in lieu of the following items.

NAME	NUMBER	MANUFACTURER
Wash Solvent	2331	Pennwalt Chemical Corp. Dallas, Texas
Sandpaper (Wet or Dry)	320 and 400 grit	Commercially Available
Nylon Wool Pads	Scotch-Brite	Commercially Available
Vapor Proof Masking Paper		Commercially Available
Vapor Proof Masking Tape		Commercially Available
Cheesecloth or Lint-Free Cotton Rags		
Neutral Patching Paste	49X2	Presto Chemicals Inc.
Grieder Tack Rags	G-99 or G-990	AltaMere Specialties
Reducer	TL-52	Finch Paint & Chemical Co.

B. Prime and Paint Cleaned Surface

(1) Apply Alumigrip wash primer to any bare metal and allow to dry for 30 minutes. Refer to manufacturer's instructions for mixing and application instructions.

NOTE: Apply first coat of primer within 2 hours after washing with ketone.

(2) Apply Alumigrip white primer per manufacturer's instructions and allow to dry 8 hours at room temperature.

(3) After primer has dried, sand with 400 grit sandpaper. Clean all sanding residue by using clean dry compressed air.

CAUTION: ON AIRCRAFT EQUIPPED WITH PAINT-COVERED (DAYTON-GRANGER) RADOME LIGHTNING DIVERTERS, TOTAL TOP COAT THICKNESS ON DIVERTERS SHALL NOT EXCEED 4 MILS. ALUMINUM RADOME LIGHTNING DIVERTER STRIPS ARE NOT TO BE PAINTED OVER.

(4) Mix and apply Alumigrip top coat per manufacturer's instructions. A second coat of top coat may be applied to obtain a uniform gloss. The second coat must be applied after a minimum of 10 minutes and before a maximum of 2 hours after the first coat was applied.

NOTE: Masking tape may be removed immediately after applying top coat. Exercise care not to stir up dirt or allow masking tape to touch wet paint. Peel masking slowly away from the new finish, never toward the new finish. Aircraft should not be moved outdoors for 16 hours after application of top coat.

(5) After paint has dried for 24 hours, rub the newly painted surface with rubbing compound.

NOTE: Allow the new paint to cure a minimum of 7 days prior to waxing.

ANTI-CORROSION CHEMICAL FILM TREATMENT - MAINTENANCE PRACTICES

1. General
 A. Aluminum surfaces must be thoroughly cleaned and stripped or deoxized prior to applying the anti-corrosion chemical film treatment.
 B. All aluminum surfaces which have been stripped down to bare metal require an anti-corrosion chemical film treatment prior to prime and painting.

2. Tools and Equipment

NAME	NUMBER	MANUFACTURER
Low Electrical Resistance Chemical Treatment	Iridite 14-9	Richardson Company
Chemical Treatment	Turcoat Accelagold	Turco Products

3. Application of Anti-Corrosion Chemical Film Treatment
 A. Prepare Aluminum Surface as follows:

 NOTE: Spray equipment shall be clean and air for spraying shall be clean and dry. The work area shall be free of dust with a temperature above 65° F.

 WARNING: ENSURE THAT THE WORK AREA IS PROPERLY VENTILATED. OBSERVE ALL SAFETY PRECAUTIONS IN THE WORK AREA TO PRECLUDE FUME BUILD-UP AND EXPOSIONS.

 (1) Clean aluminum surface as follows:

 CAUTION: MASK-OFF AREAS ADJACENT TO THE PROCESSED AREA TO PROVIDE PROTECTION OF PAINT.

 (a) Wipe off excess oil and grease.
 (b) Apply MEK to surface with clean cotton cloth.
 (c) Scrub surface, as necessary, to loosen soils.
 (d) Repeat MEK application, as necessary, to remove all soils.
 (e) Dry surface thoroughly with dry clean cotton cloth. Do not allow MEK to air dry as a residue remains on the surface.

 (2) Prepare aluminum surface for chemical film treatment by stripping or deoxidizing the surface as follows:

 CAUTION: MASK-OFF AREAS ADJACENT TO THE PROCESSED AREA TO PROVIDE PROTECTION AGAINST OVERSPRAY.

(a) Mix deoxidizing solution, 6 to 10 oz. of Diversey No. 1342 to one gallon of water. Maintain mixture at a temperature between 75° to 100° F.
(b) Apply deoxidizing solution to metal surface for 4 to 8 minutes.
(c) Rinse thoroughly with cold water.

NOTE: Two chemical treatments are provided, only one must be used. If protection against corrosion where low electrical resistance is required, proceed to step (6).

(3) Mix chemical treatment solution, 0.5 oz. of Turcoat Accelagold per gallon of water.

NOTE: If the chemical treatment solution has been mixed for sometime, test the solution for a pH of 1.5 to 2.1. Add up to 1.5 oz. of Turcoat Accelagold per gallon of solution in 0.5 oz. quantities per gallon of water until the pH is within limits.

(4) If the part is to be treated prior to installation on the aircraft and facilities are available for dipping the part, proceed as follows.
(a) Maintain the chemical treatment solution at a temperature between 60° to 100° F.
(b) Dip the part from 2 to 5 minutes.
(c) Rinse the part with 60° to 100° F water and then with 100° to 160° F water.
(d) Air dry part at 60° to 160° F. Do not wipe dry.

CAUTION: AVOID HANDLING TREATED PARTS AS FINGERPRINTS WILL HAVE A DETRIMENTAL EFFECT TO CONDUCTIVE COATING ADHESION.

(e) Visually inspect part to determine that the protective film is continuous, free from breaks, scratches and other damage. If the finish is powdery the part must be stripped per step (2) and reprocessed.

(5) If the area to be treated is on the aircraft or facilities are not available for dipping, proceed as follows:
(a) Mix chemical treatment solution and check pH as described in step (3).

CAUTION: TAKE PRECAUTIONS TO PROTECT AREAS WITH GOOD PAINT FROM THE CHEMICAL TREATMENT.

(b) If the area to be treated is scratched or damaged paint, strip the area, lightly, with aluminum wool.
(c) Clean area per step (1) and deoxidize area per step (2).
(d) Brush or swab chemical treatment solution on the area to be treated. The solution should be applied around the periphery of the stripped area to ensure that a continuous chemical film is produced.
(e) Wash area with 60° to 100° F water and then with 100° to 160° F water using a sponge.
(f) Air dry part at 60° to 160° F. Do not wipe dry.
(g) Visually inspect treated area to determine that the protective film is continuous, free from breaks, scratches and other damage. If the finish is powdery, the area must be stripped per step (2) and reprocessed.

(6) Apply Iridite 14-9 chemical film treatment as follows:
(a) Mix low electrical resistance chemical treatment solution, 0.2 ounce Iridite 14-9 per gallon of water.

NOTE: If the Iridite solution has been mixed for sometime, test the solution for pH of 2.0 to 2.6. Adjust the amount of Iridite 14-9 (0.1 to 3 ounces per gallon of water) to maintain the pH within limits.

CAUTION: TAKE PRECAUTIONS TO PROTECT AREAS WITH GOOD PAINT FROM THE CHEMICAL TREATMENT.

(b) Strip damaged area lightly with aluminum wool.
(c) Clean area per step (1) and deoxidize area per step (2).
(d) Brush or swab solution on treated area and around the periphery to ensure a continuous chemical film. Keep the area wet with solution of 1 to 4 minutes.
(e) Wash treatment solution from the part with water and clean cloth.
(f) Allow the part to air dry.
(g) Visually inspect treated area to determine that the chemical film is continuous, free from breaks, scratches and other damage. If the treated area does not have a light bronze color, the area will have to be stripped per step (2) and reprocessed.

CONDUCTIVE COATING - MAINTENANCE PRACTICES

1. Description
 A. Application of the conductive coating to the outside surface of plastic laminated and aluminum surfaces is accomplished to aid in static discharge.
 B. Conductive coating is applied over entire surface of the part including the attaching rivets and screws. This provides a conductive path for static electricity (gathered on the outer surface of the aircraft) to be discharged to the aircraft structure (ground).

2. Tools and Equipment

NAME	NUMBER	MANUFACTURED
CAT-A-LAC Filler Putty	467-2 White	Bostik Finch
Catalyst	CA-41	Bostik Finch
CAT-A-LAC Primer	463-12-8	Bostik Finch
Catalyst	CA-116	Bostik Finch
Black Air-Dry Conductive Coating	463-6-14	Bostik Finch
Catalyst	CA-97	Bostik Finch
White Top Coat	Alumagrip AA-92 line	U.S. Paint & Chemical Co.
Reducer	TL-52	Bostik Finch
Abrasive Paper	320 Grit 400 Grit	
Glaze	Prestic 23X1	Presto Chemicals Inc.
Cheesecloth or Cotton Cloth		
Methyl Ethyl Ketone (MEK)		
Methyl Ethyl Ketone Proxide		
Squeegee		
Acetone		
Aluminum Wool		
Gram Balance Scale		
Spray Gun (Fluid Line Pressure 5 psi)		
Super Koropon Curing Solution	528T202	Desoto Aerospace
	910-006	Desoto Aerospace

3. Conductive Coating Application

A. Application of conductive coating to plastic laminated surfaces other than the radome is as follows.

NOTE: Spraying equipment shall be clean and air for spraying shall be clean and dry. The finish area shall be above 65° F and free of dust.

WARNING: ENSURE THAT THE SPRAYING AREA IS PROPERLY VENTILATED. OBSERVE ALL SAFETY PRECAUTIONS IN THE WORK AREA TO PRECLUDE FUME BUILD-UP AND EXPLOSIONS.

CAUTION: THE PART TO BE PROCESSED MUST BE INSPECTED FOR CONDITION PRIOR TO STARTING THIS PROCEDURE. CONDUCTIVE COATING IS NOT TO BE APPLIED TO TRANSPARENT SURFACES SUCH AS WINDOWS, LENS, ETC.

(1) Inspect part to determine condition.

(a) On Aircraft 25-070 thru 25-273, if the part is smooth without pin holes or other defects, lightly hand sand entire primed surface with 320 grit abrasive paper and proceed with step (11).

(b) On Aircraft 25-070 thru 25-273, if the part has old paint removed and is uneven proceed with step (2).

(c) If a replacement part from the factory is to be installed proceed with step (21).

(d) On Aircraft 25-274 and Subsequent, if the part is smooth without defect proceed with step (22).

(e) On Aircraft 25-274 and Subsequent, if the part has paint removed and is uneven, determine the depth of the material removed. If enough material has been removed to uncover the attaching screws or rivets (base metal), proceed with step (2). If the attaching screws or rivets are still covered with material, perform steps (2) thru (10) and then proceed to step (22).

(2) Wash plastic laminated surface with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with dry clean cotton cloth or cheesecloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

CAUTION: USE EXTREME CARE NOT TO SAND THROUGH OUTER RESIN COAT INTO THE FIBERGLASS CLOTH WHEN PREPARING SURFACE FOR FILLER PUTTY.

(3) Sand plastic laminated surface, by hand, using 320 grit abrasive paper.

(4) Clean plastic laminated surface with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with dry clean cotton cloth or cheesecloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

(5) Mix filler putty (467-2) at a ratio of 100 grams to 2.53 grams of catalyst (CA-41). Stir thoroughly.

NOTE: The mixed filler putty will have a pot life of 8 hours at room temperature.

(6) Apply the mixed filler putty to the laminated surface with a squeegee. Work filler putty over the entire surface to fill in pin holes, etc. Remove excess filler putty from the laminated surface with squeegee.

(7) Allow filler putty to cure at room temperature for 24 hours.

(8) After the filler putty has cured, sand surface, by hand, with 320 grit abrasive paper until smooth.

(9) Clean plastic laminated surface with acetone or MEK using clean cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

(10) Inspect plastic laminated surface for pin holes or other defects. Repeat steps (3) through (9), if necessary.

(11) Mix primer by volume, one part of primer (463-12-8) to one part catalyst (CA-116). Thoroughly stir with a paddle. Thin mixture with up to 10% reducer (TL-52) for sprayability. Mix thoroughly.

NOTE: The mixed primer will have a pot life of 8 hours at room temperature.

(12) Apply primer mixture to the plastic laminated surface evenly without interruption 0.0008 to 0.0013-inch thickness.

(13) Allow primer to cure for 24 hours at room temperature. Primer may be force cured for 30 minutes at 180°F.

(14) After primer has cured, sand paper, by hand, until smooth with 400 grit abrasive paper.

(15) Clean surface with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with clean dry cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

(16) Inspect surface for pin holes or other defects. Repeat steps (10) through (15), if necessary.

(17) Mix Black Air-Dry Conductive Coating by volume, three parts conductive coating (463-6-14) to one part catalyst (CA-97). Stir thoroughly. Thin conductive coating mixture with up to 10% reducer (TL-52) for sprayability. Mix thoroughly.

NOTE: After mixing, the conductive coating mixture will appear to be setting up (gel appearance). This "gel appearance" is normal. The conductive coating mixture has a pot life of 8 hours at 65° to 75° F.

(18) Clean plastic laminated surface with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with a clean dry cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

NOTE: The purpose of the conductive coating is diminished if it does not come in contact with the attaching parts. The attaching parts (screws or rivets) provide a conductive path from the conductive coating to the airframe structure (ground).

(19) Spray two coats of the conductive coating on the laminated surface (at 90° to each other) to achieve 0.0012 to 0.0018 inch dry film thickness. Apply conductive coating so that it will make contact with the attaching rivets or screws.

NOTE: Use a suction gun or pressure pot gun of 35 to 45 psi pressure with approximately 5 psi fluid line pressure.

(20) Allow conductive coating to cure for 4 hours at 65° to 75° F. Conductive coating may be force cured at 150° F for 1 hour.

(21) Install plastic laminated part on aircraft.

NOTE: Prior to installing part on aircraft, paint all countersink holes with a light coat of Black Air-Dry Conductive Coating, mixed per step (17). Install attaching parts while conductive coating is wet.

(22) Prime and apply finish topcoat in accordance with procedures in 20-50-00.

B. Application of conductive coating to the laminated surface of the radome is as follows.

NOTE: Spraying equipment shall be clean and air for spraying shall be clean and dry. The finish area shall be above 65° F and free of dust.

WARNING: ENSURE THAT THE SPRAYING AREA IS PROPERLY VENTILATED. OBSERVE ALL SAFETY PRECAUTIONS IN THE WORK AREA TO PRECLUDE FUME BUILD-UP AND EXPLOSIONS.

CAUTION: THE RADOME TO BE PROCESSED MUST BE INSPECTED PRIOR TO STARTING THIS PROCEDURE.

(1) Inspect radome to determine condition.
 (a) On Aircraft 25-070 thru 25-273, if the radome is smooth without pin hole or other defect proceed with step (11).
 (b) On Aircraft 25-070 thru 25-273, if the radome has old paint and is uneven proceed with step (2).
 (c) If a replacement radome from the factory is to be installed proceed with step (21).
 (d) On Aircraft 25-274 and Subsequent, if the radome is smooth without pin holes or other defects, proceed with step (21).
 (e) On Aircraft 25-274 and Subsequent, if the radome has paint removed and is uneven, determine the depth of the material removed. If enough material has been removed to uncover (bare metal) of the attaching parts, proceed with step (2). If the attaching parts are still covered (no metal) perform steps (2) thru (10) and then proceed to step (21).

(2) Wash exterior surface of the radome with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with dry clean cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

CAUTION: USE EXTREME CARE NOT TO SAND THROUGH OUTER POLYESTER RESIN COAT INTO THE FIBERGLASS CLOTH.

(3) Sand radome surface by hand using 320 grit abrasive paper.

(4) Clean radome surface with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with dry cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

(5) Mix filler putty (467-2) at a ratio of 100 grams to 2.53 grams of catalyst (CA-41). Stir thoroughly.

NOTE: The mixed filler putty has a pot life of 8 hours at room temperature.

(6) Apply the mixed filler putty to the radome surface with a squeegee. Work filler putty over the entire surface to fill in pin holes, etc. Remove excess filler putty from the radome surface with squeegee.

(7) Allow filler putty to cure at room temperature for 24 hours. It may be force cured for 20 to 30 minutes at 250°F.

(8) Ensure that the filler putty is fully cured and sand the radome surface by hand with 320 grit abrasive paper until smooth.

(9) Clean radome surface with acetone or MEK using clean cheesecloth or cotton cloth. Dry surface thoroughly with clean dry cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

(10) Inspect exterior surface of the radome to ensure that all pin holes and surface defects are filled. Repeat step (3) through (10) if necessary.

(11) Mix primer by volume, one part primer (463-12-8) to one part catalyst (CA-116). Thoroughly stir with a paddle. Thin primer mixture with up to 10% reducer for sprayability. Mix thoroughly.

NOTE: The mixed primer has a pot life of 8 hours at room temperature.

(12) Apply primer mixture evenly without interruption over the entire surface of radome to attain a dry film thickness of 0.0008 to 0.0013 inch.

(13) Allow primer mixture to cure for 24 hours at room temperature.

(14) After primer has cured, sand surface by hand until smooth with 400 grit adhesive paper.

(15) Clean all drill holes and remove filler putty and foreign matter from aircraft mating edge.

(16) Clean radome external surfaces with acetone or MEK using clean cheesecloth or cotton cloth. Dry thoroughly using dry clean cheesecloth or cotton cloth. Do not allow acetone or MEK to air dry as a residue remains on the surface.

(17) Mix equal parts of conductive coating (Super Koropon 528T202) with curing solution (910-006). Thin conductive coating mixture with up to 10% maximum with MEK for sprayability, if required. Mix thoroughly.

NOTE: Allow conductive coating mixture 1/2 hour aging time prior to application. Pot life of conductive coating mixture is approximately 8 hours at room temperature.

CAUTION: DO NOT APPLY CONDUCTIVE COATING IF AMBIENT TEMPERATURE IS BELOW 65° F.

(18) Spray conductive coating mixture over the entire exterior, aft edge and a strip on the interior approximately 2 inches wide forward of the aft edge. Application shall be applied without interruption to achieve a dry film thickness of 0.006 to 0.001 inch.

(19) Allow radome to cure for 24 hours at room temperature. It may be force cured for 2 hours at 150° F.

(20) After conductive coating has cured, install radome on the aircraft.

(21) Prime and apply finish topcoat in accordance with procedures in 20-50-00.

C. Application of conductive coating to aluminum surfaces is as follows:

(1) Prepare the aluminum surface for anti-corrosion chemical treatment

by cleaning and stripping or deoxidizing the surface as described in 20-51-00.

(2) Apply Iridite 14-9 anti-corrosion chemical film treatment as described in 20-51-00.

CAUTION: PERFORM CONDUCTIVE COATING TREATMENT IMMEDIATELY AFTER ANTI-CORROSION CHEMICAL FILM TREATMENT HAS DRIED (NOT TO EXCEED 12 HOURS).

(3) Apply conductive coating as follows.

(a) Mix Black Air-Dry Conductive Coating by volume, three parts conductive coating (463-6-14) to one part catalyst (CA-97). Stir thoroughly. Thin conductive coating mixture with up to 10% reducer (TL-52) for sprayability. Mix thoroughly.

NOTE: After mixing the conductive coating mixture will appear to be setting up (gel appearance). This "gel appearance" is normal. The conductive coating mixture has a pot life of 8 hours at 65° to 75° F.

CAUTION: MASK-OFF AREAS ADJACENT TO THE PROCESSED AREA TO PROVIDE PROTECTION OF PAINT FROM OVERSPRAY.

NOTE: The purpose of the conductive coating is diminished if it does not come in contact with the attaching parts (screws or rivets) to provide a conductive path from the conductive coating to the airframe structure (ground).

(b) Spray two coats of conductive coating on the aluminum surface (at 90° to each other) to achieve a 0.0012 to 0.0018 inch dry film thickness. Apply conductive coating so that it will make contact with the attaching rivets or screws.

NOTE: Use a suction gun or pressure pot gun of 35 to 45 psi pressure with approximately 5 psi.

(c) Allow conductive coating to cure for 4 hours at 65° to 75° F. Conductive coating may be force cured at 150° F for 1 hour.

(4) Prime and apply finish topcoat in accordance with procedures in 20-50-00.

ENGINE PYLON FIREWALL FIREPROOFING PAINT - MAINTENANCE PRACTICES

1. General
 A. Engine pylon firewall fireproofing paint maintenance practices cover preparation and repair of painted surfaces of the engine pylon firewall.
 B. When repairing engine pylon firewall painted surface, use only type of fireproofing paint and primers referred to in tools and equipment list or its equivalent.

2. Tools and Equipment

NAME	NUMBER	MANUFACTURER
Methyl Ethyl Ketone	TT-M-261	
Sealant (Dapcocast)	18-4	D. Aircraft Products Co. 1191 Hawk Circle Anaheim, CA 92807
Base Primer (Super Koropon Fluid Resistance)	515-344	Desoto Inc. P.O. Box 401267 Garland, TX 75040
Curing Solution (Super Koropon Fluid Resistance)	910-350	Desoto Inc. P.O. Box 401268 Garland, TX 75040
Base Primer (CAT-A-LAC)	463-12-8	Bostik Div. Emhart Corp. 20846 S. Normandie Ave. Torrance, CA 90502
Catalyst (CAT-A-LAC)	CA-116	Bostik Div. Emhart Corp. 20846 S. Normandie Ave. Torrance, CA 90502
Base Primer	463-660	Pratt & Lambert P.O. Box 2153 Wichita, KS 67201
Curing Agent	120-650	Pratt & Lambert P.O. Box 2153 Wichita, KS 67201
Paint (Fireproofing)	Ocean No. 1644	Barnard Chemical Co., Inc. P.O. Box 1105 Covina, CA 91722
Sandpaper	180 grit	Commercially Available

NAME	NUMBER	MANUFACTURER
Sandpaper	320 grit	Commercially Available
Sandpaper	400 grit	Commercially Available
Cotton Cloth		Commercially Available
Vapor Proof Masking Tape		Commercially Available
Acid Brush		Commercially Available
Bristle Brush (Not Nylon)		Commercially Available

3. Painting

A. Prepare Surface for Painting.

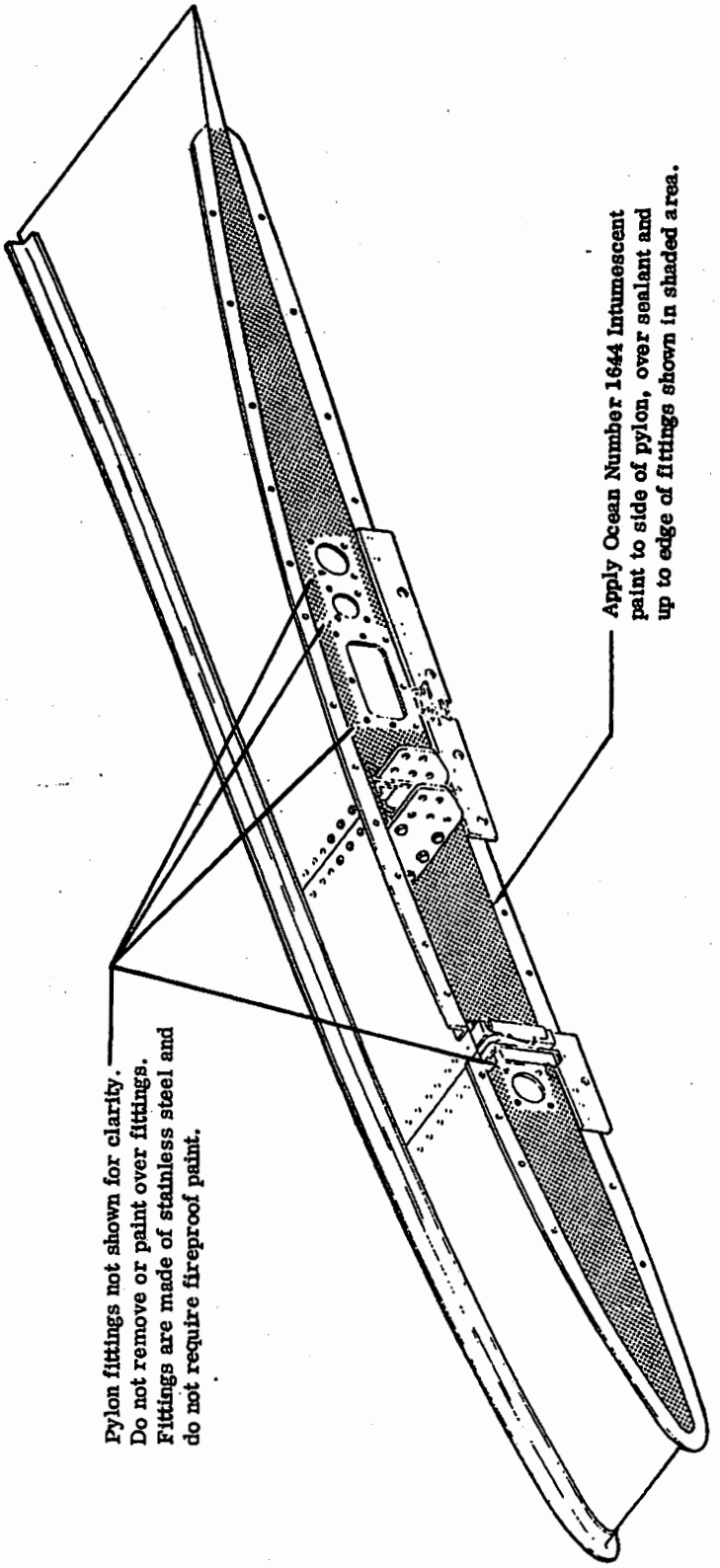
WARNING: SURFACE PREPARATION AND APPLICATION OF FIRE-PROOF PAINT MUST BE ACCOMPLISHED IN A WELL VENTILATED AREA.

(1) Thoroughly scrub surface to be painted using methyl ethyl ketone (MEK) and a cotton cloth.
(2) Remove loose paint, soil, oxides, and sealer from surface by lightly buffing with abrasive cloth or fine grit sandpaper.
(3) Replace loose and removed firewall sealant.
(4) Thoroughly clean surface with MEK and wipe surface dry with a clean dry cotton cloth. Replace any removed sealant using Dapcocast #18-4 firewall sealant (manufactured by D. Aircraft Products Co., 1191 Hawk Circle, Anaheim, CA 92807). Allow sealant to cure.
(5) Using vapor-proof masking tape, tape off portion of pylon firewall that is not to be painted as shown in figure 201.

B. Apply a brush coat of epoxy primer on surface to be painted as follows:

NOTE: • Use one of the primer systems described below:

- Thoroughly mix one volume of base primer #515-344 and one volume of curing solution #910-350, Super Koropon Fluid Resistant Primer available from: Desoto, Inc., P.O. Box 401268, Garland, TX 75040.
- Thoroughly mix one volume of primer base #463-12-8 and one volume of Catalyst CA-116 Cat-A-Lac corrosion resistant primer available from: Bostik Div. Emhart Corp., 20846 S. Normandie Ave., Torrance, CA 90502.



Application of Fireproof Paint to Engine Firewall.

Figure 201

NOTE: Thoroughly mix one volume of primer base #483-660 and one volume of curing agent #120-650 available from Wichita Division, Pratt & Lambert, P.O. Box 2153, Wichita, KS 67201.

(1) After one of the primer systems described above has been thoroughly mixed, apply a brush coat 6 to 12 mils (0.006 to 0.0012) inch of primer over the prepared surface of engine pylon firewall including the fire sealant.

(2) Allow primer to dry at room temperature for a minimum of two hours or hard to fingernail before applying paint.

C. Apply brush coat of fireproof paint as follows:

(1) Thoroughly mix Ocean Number 1644 fireproof paint (distributed by Barnard Chemical Co., Inc., P.O. Box 1105, Covina, CA 91722.

D. Apply brush coat of fireproof paint at approximately 5 to 6 mil in thickness. Allow paint to become tack free (approximately 2 hours). Apply succeeding brush coats until a 30 mil (0.0030) inch minimum thickness of dry film has been attained.

E. After paint has cured, install engines and perform operational checks per Learjet Maintenance Manual.

TIP TANK AND EXTERNAL DEFOG NOZZLE EROSION SHOE - MAINTENANCE PRACTICES

1. General
 A. Erosion shoe maintenance practices cover the preparation and application of the Gaco N-79 coating system that is used to coat the leading edge of the external defog nozzles to prevent erosion of paint.
 B. The Gaco coating system is manufactured by Gates Engineering Company, Wilmington, Delaware 19899. Kits are available thru Gates Learjet Spares Department.

2. Tools and Equipment

NAME	NUMBER	MANUFACTURER
Masking Tape		Commercially Available
Sandpaper	180 grit	Commercially Available
Primer	N-15	Gates Engineering Co.
Coating Kit*	N-79	Gates Engineering Co.
Toluene		Commercially Available
Stiff Bristle Brush		Commercially Available

*N-79 Coating Kit consists of:
N-15 Primer
N-700-9 Top Coat
N-300-9 Catalyst
N-450-9 Thinner
N-81 Anti-Static Top Coat

3. Removal/Installation
 A. Replace Erosion Shoe
 (1) Mask along the edge of the old coating being replaced.
 (2) Remove the old coating using toluene soaked rags and a stiff bristle brush.
 (3) After old coating is removed sand surface with 180 grit sandpaper and wash area with toluene and wipe dry.
 (4) Stir N-15 primer thoroughly and spray sufficient coats of primer to defog nozzle to give a dry film thickness of .001 to .002 inch. Allow a minimum of 5 minutes drying time between each primer coat. Allow a minimum of 2 hours drying time before applying the N-700-9 top coat.
 (5) Using the coating kit thoroughly stir N-300-9 accelerator. Mix

N-300-9 accelerator with N-700-9 top coat at a ratio of two fluid ounces of N-300-9 to one quart of N-700-9.

NOTE: Once the top coat and accelerator have been mixed it shall be used within 8 hours and shall not be gelled.

(6) For spray application, thin top coat mixture (step 5) with 2 parts N-450-9 thinner by volume to 1 part by volume of the topcoat mixture.

(7) For brush application, thin top coat mixture (step 5) with 1 part N-450-9 thinner by volume to 4 parts by volume of the topcoat mixture.

(8) Apply top coat in multiple coats by either spraying or brushing. Allow each coat to dry from 10 minutes to 1 hour prior to application of the next coat. Coating thickness shall be .007 to .010 inch when cured.

NOTE: Air bubbles may be removed by spraying with a fine mist of N-450-9 after each application.

NOTE: Normally 4 brush coats or 8 spray coats will give the specified cured thickness for the topcoat.

(9) After top coat has been applied the N-81 anti-static top coat must be applied within a minimum of 10 minutes and a maximum of 30 minutes.

(10) When N-81 anti-static top coat is being applied with a brush no thinning is required. If N-81 anti-static top coat is to be sprayed on,the anti-static top coat can be thinned with a maximum of 2 parts by volume of N-450-9 thinner to 1 part by volume of N-81 anti-static topcoat.

(11) Apply anti-static top coat in multiple coats by either spraying or brushing. Allow enough time between coats for the shiny wet appearance to disappear (approximately 10 minutes). Apply coats to a total thickness of .001 to .002 inch.

NOTE: Normally 2 or 3 coats will give the specified thickness for the anti-static topcoat.

(12) Full cure of the erosion coating will be attained in 4 days under normal temperature.

NOSE CONE EROSION SHOE - MAINTENANCE PRACTICES

1. General
 A. An erosion shoe is installed over the forward portion of the nose cone. The erosion shoe protects the nose cone from weather and other damage.

2. Tools and Equipment

NAME	NUMBER	MANUFACTURER
Erosion Shoe	3A1679	B. F. Goodrich
Cement	EC-1403 or EC-1300L	3M Company
Scissors or V-Knife		Commercially Available
Toluol		Commercially Available
Methyl Ethyl		Commercially Available
Rags (Clean and lint free)		Commercially Available
Sponge Roller (2-inch)		Commercially Available
Paint Brush		Commercially Available
Flexible Straightedge		Commercially Available
Hypodermic Needle	22 Gage	Commercially Available

3. Removal and Installation
 A. Remove Nose Cone Erosion Shoe

 WARNING: THE CEMENTS AND SOLVENTS USED FOR REMOVAL AND INSTALLATION OF THE EROSION SHOE ARE FLAMMABLE AND THEIR FUMES ARE TOXIC. ALL WORK SHOULD BE DONE IN A WELL VENTILATED AREA AWAY FROM ANY SPARKS OR FLAME.

 (1) Clean nose cone along aft edge of erosion shoe with MEK. Apply masking tape on nose cone along the edge of the erosion shoe. This will establish the trim line for the new shoe.
 (2) Apply MEK to aft edge of the erosion shoe. Allow approximately 2 minutes for cement to soften.
 (3) Slowly peel the erosion shoe away from the nose cone while applying MEK along the separation line.

(4) After the erosion shoe has been removed, clean cement from the nose cone using a clean cloth and MEK.

NOTE: The longer the erosion shoe has been cemented to the nose cone the more difficult it will be to remove. It is easier to remove the shoe in pieces and then wash the cement from the nose cone.

B. Install Nose Cone Erosion Shoe

NOTE: Installation must be accomplished in an area where the ambient temperature is between 40° and 110°F and the humidity is below 95%.

(1) Thoroughly clean the nose cone surface with a clean cloth moistened with MEK. Final clean the nose cone by wiping off the MEK before it dries using a clean dry cloth. Repeat the final cleaning operation at least twice.
(2) Thoroughly clean surfaces of the erosion shoe using a clean cloth moistened with MEK. Change cloths frequently to avoid contamination of cleaned areas.

NOTE: The erosion shoes are dusted before packing to prevent the shoe inner surface from sticking together. The surfaces must be cleaned to assure proper bonding to the nose cone.

(3) Mix cement by combining two parts of cement to one part of MEK. Mix thoroughly.

(4) Apply one even brush coat of cement to both the inside (rough) surface of the erosion shoe and the nose cone surface to the masking tape.

NOTE: The cement must be applied evenly on both surfaces to assure that the outside surface of the erosion shoe will be smooth.

(5) Allow the first coat to air dry a minimum of 30 minutes. If temperature is below 50°F, allow 1 hour drying time.
(6) Apply a second coat of cement to both surfaces. Allow at least 1 hour drying time or until adhesive is dry and tack-free.
(7) Using a flexible straightedge, draw a vertical centerline on the nose cone to match the vertical centerline on the inside of the erosion shoe.

(8) Position the erosion shoe on the nose cone with the two cemented surfaces against each other. With the shoe positioned on the nose cone, align the reference lines.

(9) Fold the erosion shoe back on itself being careful not to move the erosion shoe with respect to the nose cone.

(10) Using a clean lint-free cloth thoroughly moistened (but not dripping) with Toluol, activate the cement on the nose of the shoe. Activate a small area on both the nose cone and erosion shoe. Avoid excessive rubbing which could remove cement from surfaces. The activation of the cement shall be done in areas of concentric circles starting at the nose cone.

(11) After cement loses "webbiness" and becomes "tacky", use sponge roller and roll activated part of shoe against the nose cone. Care must be exercised to prevent trapping air between the shoe and nose cone. Match the reference lines as the shoe is rolled down. Avoid stretching the shoe, otherwise difficulty will be encountered around the trailing edge.

(12) With the loose part of the erosion shoe rolled back, activate a section adjacent to the bonded area using the same procedure as in step 10.

(13) When the cement has reached the right stage of tack, roll the section of the shoe as in step 11.

(14) Continue in this manner until the erosion shoe is completely installed, then roll the entire surface with the sponge roller. Apply pressure and roll from the nose toward the trailing edge of the shoe.

NOTE: When cementing, activating, and rolling erosion shoe on nose cone, work from the nose up. Do not attempt to put down one side completely before working on the opposite side.

NOTE: Avoid twisting or sharp creasing of the erosion shoe, otherwise cement may be pulled loose from one of the surfaces. In the event it becomes necessary to remove or loosen installed shoe, use Toluol to soften the "adhesion" line. A minimum amount of Toluol should be applied to the parting line while slight tension is applied to the shoe. In peeling back the erosion shoe, removal should be slow enough to allow the solvent to separate the interface of the cement coats. If the cement is pulled loose from either the nose cone or the shoe, the area must be recemented.

Care must be exercised to assure that all areas are activated and that no areas are left dry.

(15) Lift excess trailing edge material up along the tape all the way around the circumference. Using a "V" knife or a pair of scissors with the blades open slightly to form a "V", cut off erosion shoe directly at the trim line by sliding scissors or knife along. Keep uniform tension on trim material.

(16) If an air pocket or blister is formed, insert a hypodermic needle into the pocket and roll to force out the air.

(17) Inspect the tapered edge to see that it is firmly cemented all around.

(18) After the cement has dried, remove masking tape and clean excess cement from nose cone, using MEK. Care must be exercised to prevent solvent from running under and loosening edges of shoe.

CORROSION REPAIR - MAINTENANCE PRACTICES

1. General
 A. The following maintenance practices are provided as an aid in repairing fuel tanks if bacterial growth and/or corrosion is evident.

2. Tools and Equipment

NAME	PART NUMBER	MANUFACTURER
Chemical Film Coating	Turcoat Accelogold	Turco Products 24600 S. Main St. Carson, Calif. 90749
Chemical Film Coating	Iridite 14-2	Allied-Kelite Products Div. Richardson Chemical Co. 2400 E. Devon Avenue Des Planes, Ill. 60016
Chemical Film Coating	Alodine 1200S	Amchem Products Inc. Brookside Ave. Ambler, Pa. 19002
Chemical Film Coating	Divercoat 7T	Diversey Chemicals 1855 S. Mt. Prospect Rd. Des Plaines, Ill. 60018
Chemical Film Coating	Bonderite 723	Specialty Chemical Group Oxy Metal Ind. Corp. 32100 Stephenson Hiway Madison Heights, Mich. 48071
Epoxy Coating	454-4-1 Base CA-109 Catalyst TL-52 Thinner	Bostick - Finch
Methyl-Ethyl-Ketone	TT-M-261	Commercially Available
Small Paint Brushes	Soft Natural or Polyester Bristle	Commercially Available
White Cotton Cloth		Commercially Available
Scrub Brush (Stiff Bristle)		Commercially Available
Vacuum Source & Suction Hose		

3. Fuel Tank Cleaning and Repair

A. Remove Bacterial Growth

(1) Using the vacuum source, vacuum up all residue from the tank bottoms. In hard to reach areas flush out residue using a squirt bottle or similar device filled with kerosene.

(2) Wipe tanks dry. Allow bacterial growth and tank to thoroughly air dry. Drying may be accelerated by use of air movers.

(3) Clean bacterial growth from tanks using a soft bristle scrub brush and clean cloth.

(4) After cleaning, inspect area for evidence of coating degradation or corrosion.

B. Corrosion Repair

NOTE: The following procedures cover minor corrosion (depth of 0.005 inch or less). If corrosion area depth exceeds these limits, contact the Gates Learjet Field Service Dept. for disposition.

(1) Corrosion pits of a minor depth (0.005 inch or less) within the tip tank and wing tank areas are removed by lightly sanding with 320 or 400 grit aluminum oxide abrasive paper.

(2) Sand an area large enough to assure that all corrosion has been removed.

(3) Clean the area with MEK and wipe dry.

NOTE: Prepare Turcoat chemical film solution by mixing 0.5 oz. of Turcoat Accelogold per gallon of water. The PH of the solution shall range from 1.5 to 2.1. If PH cannot be maintained, nitric acid may be added.

If other chemical film solutions are used, follow manufacturer's instructions.

(4) Brush on chemical film over reworked area and over the adjoining area as far as necessary to produce a continuous film coating.

(5) Thoroughly rinse treated area with water, using a brush or sponge.

(6) Allow treated area to dry in a temperature range of 60° to 160°F.

NOTE: Coat with epoxy primer immediately after area is dry.

(7) Prepare epoxy finish by mixing three (3) parts of base (P/N 454-4-1) and one (1) part of catalyst (P/N CA-109).

(8) Epoxy finish may be thinned if necessary by adding one (1) part thinner (P/N TL-52) to one (1) part epoxy.

(9) Allow material to set 45 minutes before using.

NOTE: Material over eight (8) hours old must be discarded.

(10) Do not apply material when temperature is below 60° F or over 85% relative humidity.

(11) Apply a thin brush coat of epoxy to treated area, using a soft natural or polyester bristle brush to obtain a continuous smooth coat.

(12) Allow epoxy finish to cure for a minimum of 24 hours above 73° F before returning the aircraft to service.

X-RAY INSPECTION - MAINTENANCE PRACTICES

1. General
 - A. In accordance with current inspection intervals, Chapter 5, portions of the aircraft are to be X-ray inspected.
 - B. Items included in this inspection are the pressurized portion of the fuselage, wing center splice, lower wing skin around fuel pump cutouts, elevator ribs, door hinges, horizontal stabilizer, vertical stabilizer and pylon.
 - C. The following information and procedures have been provided as an aid in X-ray inspection. Information has not been provided for the actual operation of X-ray equipment due to the many types of equipment. For information on specific equipment, refer to the manufacturer's operating and maintenance instructions.

2. X-Ray Inspection Precautions
 - A. When using X-ray equipment, be familiar with the manufacturer's operating instructions and pay particular attention to warnings and precautions.
 - B. It is recommended that a remote warning light be used with X-ray equipment to alert personnel of existing danger. A remote warning light receptacle is generally provided on the X-ray control unit. The following warnings are general and additional warnings may be listed in the manufacturer's instructions.

WARNING:
- DANGEROUS RADIATION EXISTS DURING OPERATION IN THE IMMEDIATE AREA OF THE X-RAY TUBE HEAD.
- DO NOT APPROACH WITHIN THE MANUFACTURER'S SPECIFIED DISTANCE OF TUBE HEAD WHEN EXPOSURE LIGHT IS ILLUMINATED ON THE CONTROL UNIT.
- ALWAYS ATTEMPT TO EXPOSE FILM WITH TUBE DIRECTED AWAY FROM CONTROL PANEL.
- A RADIATION MONITOR SHOULD BE USED DURING EXPOSURE TO WARN PERSONNEL OF RADIATION HAZARDS.
- LETHAL VOLTAGES EXIST WITHIN THE EQUIPMENT. DO NOT ATTEMPT TO PERFORM MAINTENANCE ON THE EQUIPMENT WHILE IT IS CONNECTED FOR OPERATION.
- ASSURE THAT ALL PERSONNEL IN THE IMMEDIATE AREA ARE INSTRUCTED TO STAY AWAY FROM ALL X-RAY OPERATIONS ACCORDING TO MANUFACTURER'S SPECIFIED DISTANCE.

3. Aircraft Preparation for X-Ray Inspection

A. Since the requirement for X-ray inspection occurs at the same time as wing removal and inspection, it is recommended that the X-ray inspection be performed while the wing is removed. This permits easier access to areas which would normally be difficult to reach. In addition, Chapter 5 requires X-ray inspection of the wing which is easily performed with the wing removed. Inspections being performed at the same interval as X-ray inspection, require removal of almost all of the interior equipment.

B. It is recommended that the X-ray inspection of the fuselage be performed at a time when most of the interior equipment is removed. Any equipment which has not been removed for inspection purposes, and is in an area to be X-rayed, must be removed.

C. Foam does not normally affect X-rays, therefore, removal of foam is not required unless verification of a crack is required.

4. X-Ray Film Handling

A. Because airframe structure consists generally of curved surfaces, a flexible film holder is used for X-ray inspection of the aircraft. Flexible film holders are ususally constructed of either cardboard or plastic and consist of a hinged front and back cover with an inner light tight envelope. These film holders may be reused, however, before reloading, open the holder and check for light leaks. Any holders which are physically damaged must be repaired or discarded. Remove any lint or dust with a dry, lint free cloth. Do not blow dust out since moisture could collect in the holder and be transferred to the film. After film is loaded into film holder, the holder must be sealed with a light proof tape such as Scotch #235 photographic tape.

5. Determining Film Type, Exposure and Distance

A. Using X-ray equipment with a minimum amount of lost time requires a set of exposure technique charts from which exposure may be determined for various thicknesses of material under given conditions. These exposure technique charts are generally available from the manufacturer's of X-ray machines and vary slightly in data between types of machine. In order to adequately identify exposure technique charts, the following items must be recorded.

(1) Type and thickness of material.
(2) Film type.
(3) Use of screens (if any).
(4) Kilovoltage.
(5) Current and exposure time.
(6) Source-to-film distances.
(7) Developing time and temperature.
(8) Film density of X-rays.

B. Only when all conditions used in making an X-ray agree exactly with the conditions of the exposure technique chart can values be read directly from the exposure technique chart. Any variation will require correction factors.

C. X-raying a section consisting of several thicknesses, such as an airframe, creates a problem which can only be solved by determining film exposure speed which is best suited to the particular application. In other words, kilovoltage, milliamperes and exposure time must be adjusted so that the X-ray shows the thinnest part with a maximum acceptable density and the thickest part with a minimum acceptable density.

D. Because airframe section thicknesses vary, the exposure technique charts can serve only as a rough guideline for airframe sections. Figures 201 thru 204 have been provided as an aid in determining material type and thickness and will provide a guide for determining X-ray exposure.

E. In some instances X-ray inspection will require multiple X-rays to be taken of a part due to extreme variance in part thickness. Loading the film holder with two or three high contrast films of different speeds is a method which is used to eliminate multiple exposures. A kilovoltage, milliampere and exposure time should be chosen so that the thickest portions of the part are recorded on the faster film and the thinnest portions of the part are recorded on the slower film.

6. General X-Ray Procedure

A. General

(1) Determine thickness and type of material in the area to be X-rayed. (Refer to figures 201 thru 204.)

(2) Determine what exposure is necessary using exposure technique charts.

(3) Locate film on area to be inspected.

NOTE: Taping flexible film holder to the aircraft skin in the usual manner in which film is held in place.

(4) Position X-ray tube on opposite side of structure so that beam is aligned with the structure to be X-rayed.

(5) Observe all safety precautions.

(6) Expose film.

NOTE: If the area to be inspected requires a series of X-rays, it is recommended that a test shot be made and developed to assure that the series of X-rays will be acceptable.

(7) Remove film from aircraft and develop using standard X-ray film developing procedures.

7. X-Ray Interpretation

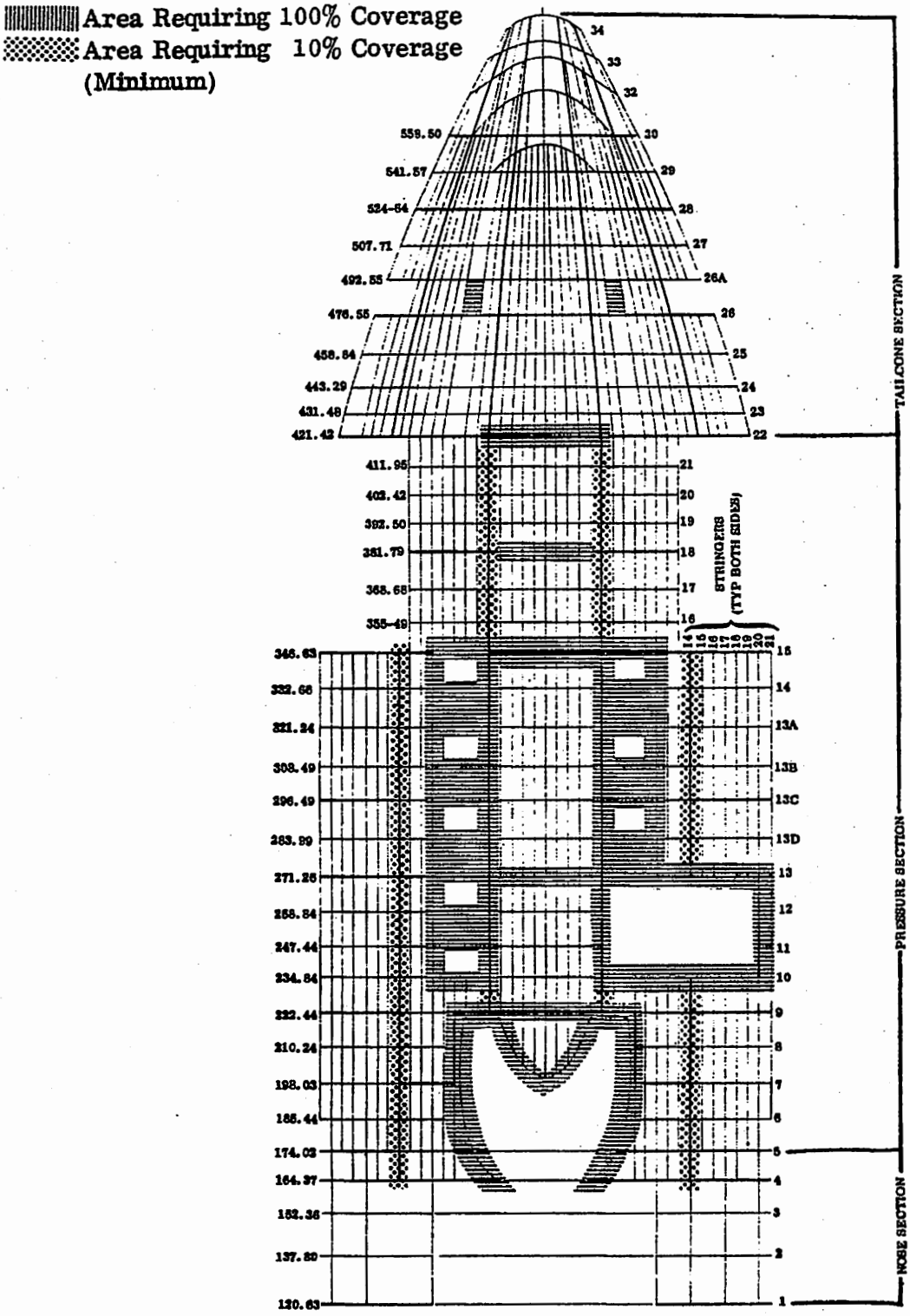
A. Interpreting an X-ray is one of the most difficult tasks involved in X-ray inspection. Fatigue cracks in aircraft structure may occur in the form of fine, hairline cracks which are the most difficult to detect. Usually, in order to detect hairline cracks, the X-ray beam must be almost parallel to the plane of the crack in order to record it on film.

B. In order to properly interpret an X-ray, one must have a complete knowledge of X-ray techniques and aircraft structure. Some questionable defects may show up in an X-ray which are not defects at all. Some of these false defects include scratches in paint or on the surface of a part, discontinuities in sealant, cracks in paint or aerodynamic filler and foreign objects such as drill shavings.

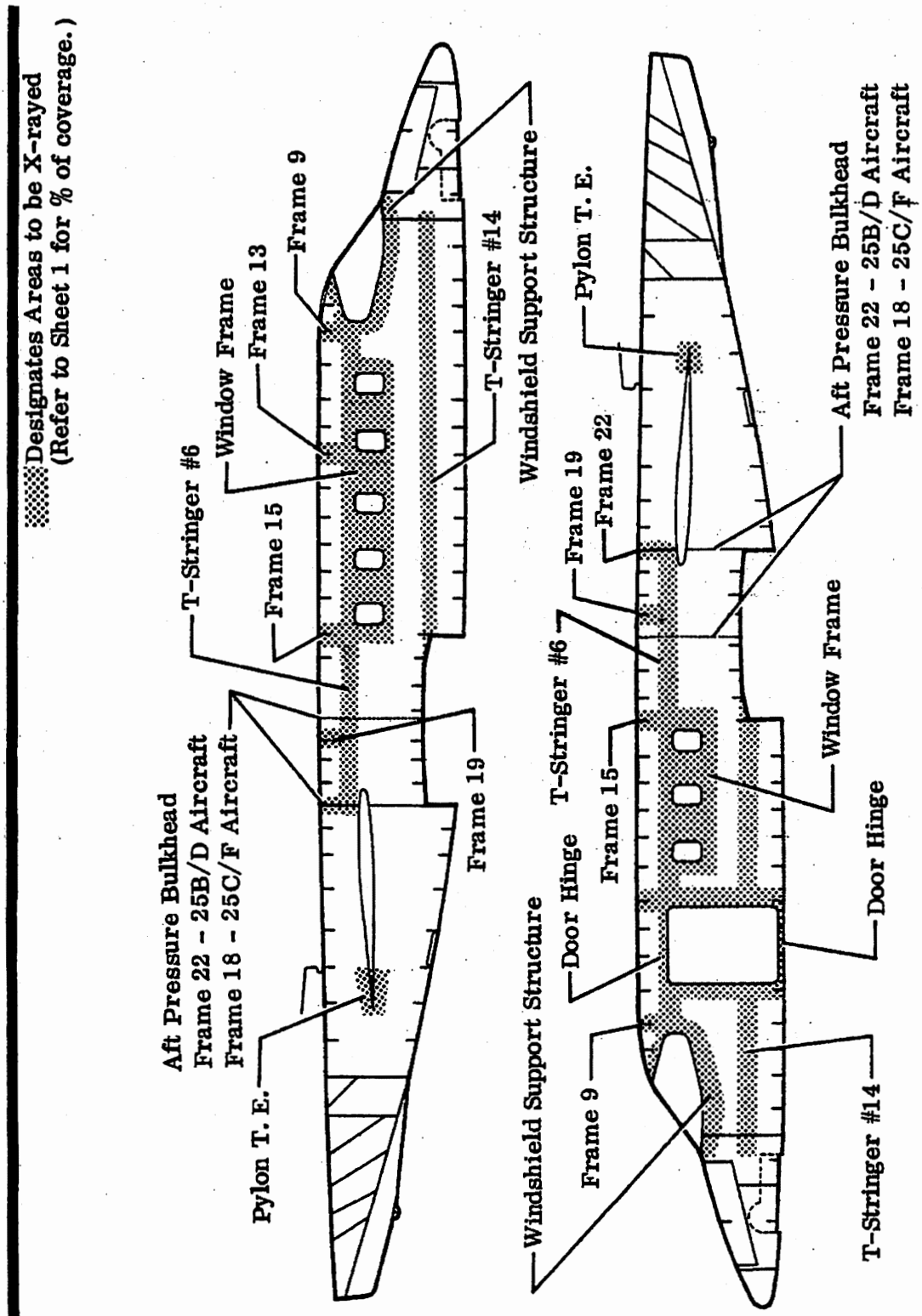
C. Experience in reading X-rays is the only way to learn to spot these false defects. In some cases the only way to define a false defect is to visually examine the part in question, which may include removal of paint and/or aerodynamic filler and foam.

Fuselage Thickness Data			
Item	Location	Thickness	Mat'l
Skin	Fwd of Fr 4	.032	2024 Al
Skin	Between Fr 4 and Fr 30	.040	2024 Al
Skin	Aft of Fr 30	.050	2024 Al
Circum Skin Splice	Fr's 10, 13, 15, 22	.020	301 SS
Frame Flange	General	.063 of .080	2024 Al
T-Stringer	General	.118	2024 Al
L-Stringer	General	.050	2024 Al
Pylon Skin	Pylon T. E.	.036	321 SS
Pylon Former	Pylon T. E.	.032	2024 Al
Window Doubler	General	.063	2024 Al
Window Retainer	General	.063	2024 Al
Windshield Channel		.040	2024 Al
Windshield Doubler		.063	2024 Al

Fuselage
Figure 201 (Sheet 1 of 3)

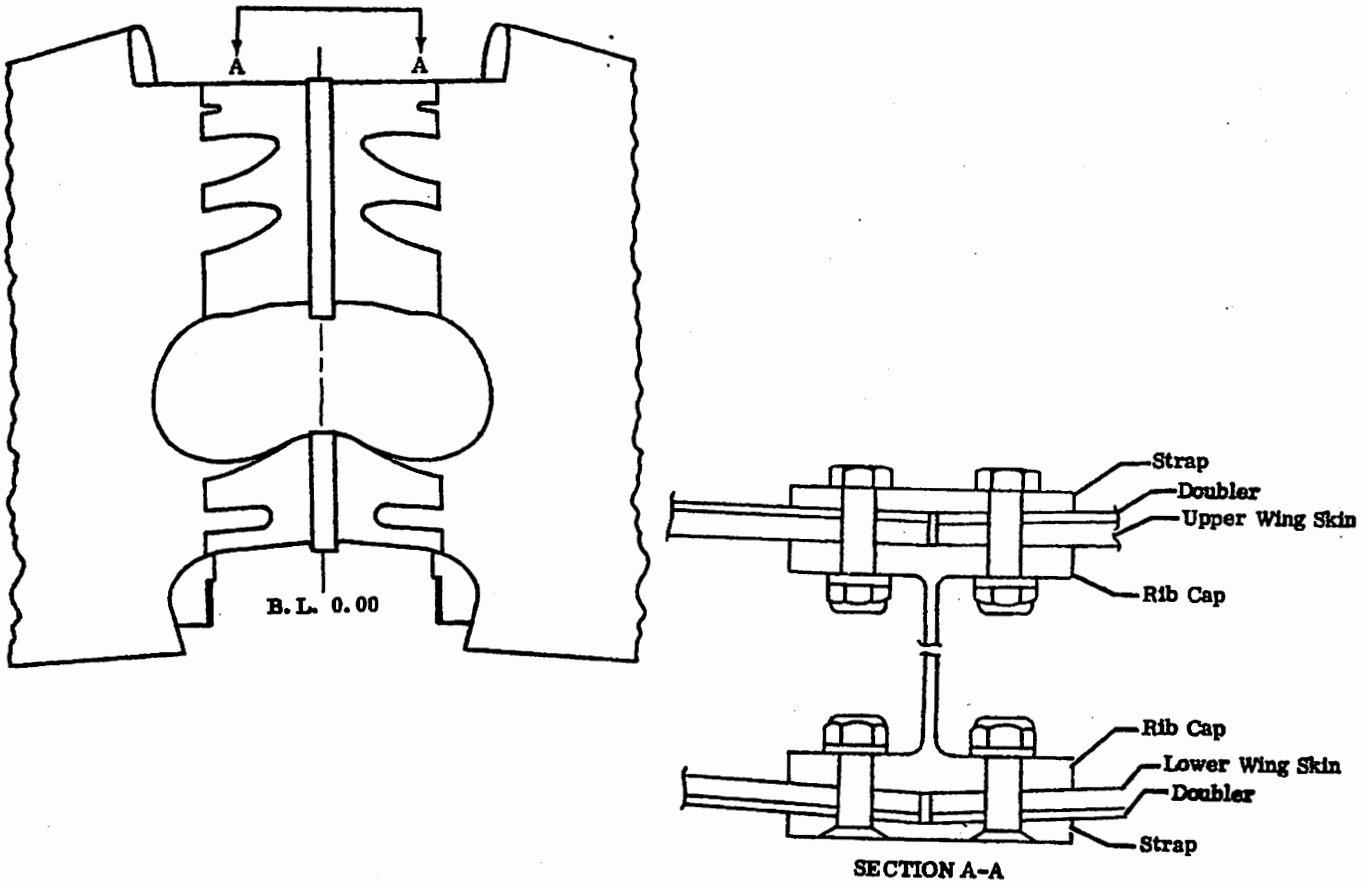


Fuselage
Figure 201 (Sheet 2 of 3)

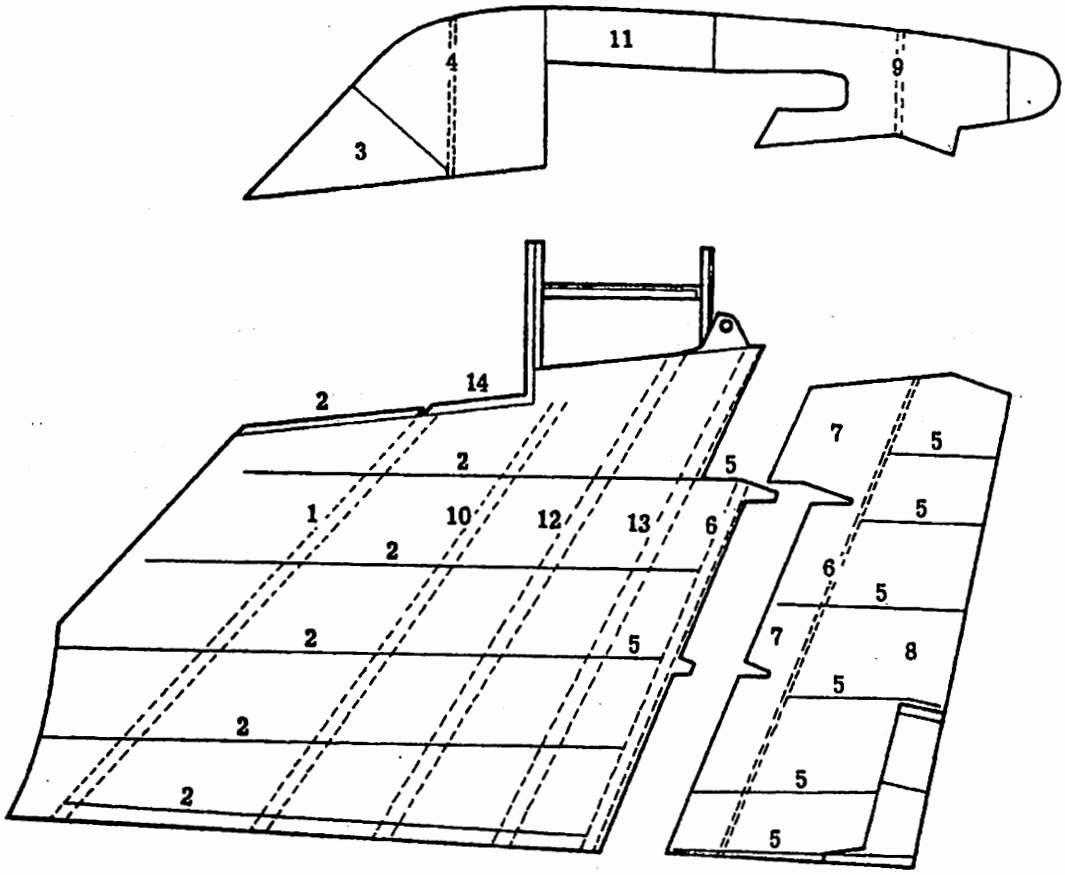


Fuselage
Figure 201 (Sheet 3 of 3)

Location	Item	Thickness (In.)	Mat'l
Upper Fwd Splice			
	Strap	.200	2024 Al
	Doubler	.080	2014 Al
	Skin	.208	2014 Al
	Rib Cap	.298	2024 Al
Lower Fwd Splice			
	Strap	.160	2024 Al
	Doubler	.090	2024 Al
	Skin	.170	2024 Al
	Rib Cap	.350	2024 Al
Upper Aft Splice			
	Strap	.200	2024 Al
	Doubler	.080	2014 Al
	Skin	.208	2014 Al
	Rib Cap	.298	2024 Al
Lower Aft Splice			
	Strap	.160	2024 Al
	Doubler	.080	2024 Al
	Skin	.170	2024 Al
	Rib Cap	.350	2024 Al



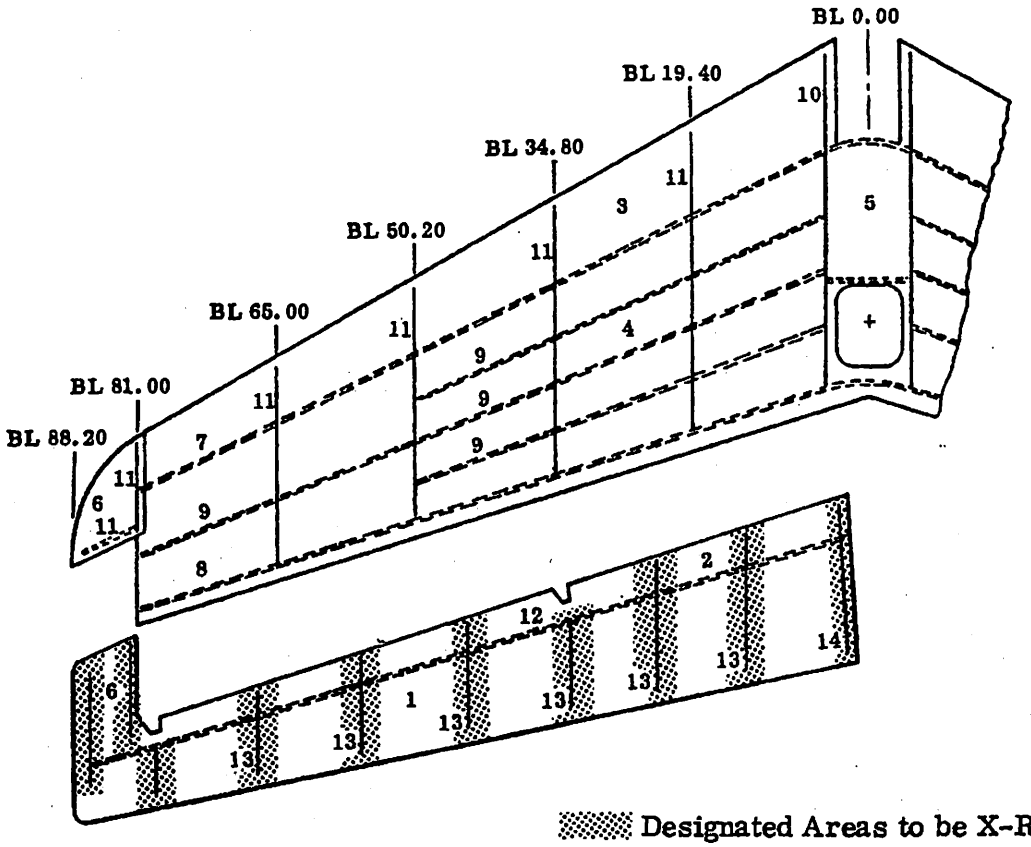
Wing Center Splice
Figure 202



X-Ray of This Structure Optional.

Thickness Details		
Item	Thickness (In.)	Mat'l
1-Spar	.050	2024 Al
2-Rib	.032	2024 Al
3-Skin	.040	2024 Al
4-Fairing	.040	6061 Al
5-Rib	.050	2024 Al
6-Spar	.063	2024 Al
7-Skin	.032	2024 Al
8-Skin	.040	2024 Al
9-Fairing	.032	6061 Al
10-Spar	.250	2014 Al
11-Fairing	.032	2024 Al
12-Spar	.170	2014 Al
13-Spar	.140	2014 Al
14-Rib	.098	2024 Al

Vertical Stabilizer
Figure 203



Thickness Details		
Item	Thickness (In.)	Mat'l
1-Skin	.025	2024 Al
2-Skin, L.E.	.032	2024 Al
3-Skin, L.E.	.040	2024 Al
4-Skin	.050	2024 Al
5-Skin	.063	2024 Al
6-Skin, Tip	.040	6061 Al
7-Spar	(See spar thickness chart)	
8-Spar	(See spar thickness chart)	
9-Stringer	.050	2024 Al
10-Rib	.250	2024 Al
11-Rib	.032	2024 Al
12-Spar	.063	2024 Al
13-Rib	.032	2024 Al
14-Rib	.032	4130 St

Spar Thickness Chart			
Spar	B.L.	Thickness (In.)	Mat'l
Front	6.00	.400	2024 Al
Front	11.02	.212	2024 Al
Front	55.12	.080	2024 Al
Front	81.00	.080	2024 Al
Rear	6.00	.400	2024 Al
Rear	11.02	.280	2024 Al
Rear	22.05	.160	2024 Al
Rear	33.07	.125	2024 Al
Rear	55.12	.080	2024 Al
Rear	81.00	.080	2024 Al

Horizontal Stabilizer and Elevator
Figure 204

BAGGAGE COMPARTMENT - MAINTENANCE PRACTICES

1. INSPECTION/CHECK

NOTE: The following maintenance practices are provided as an aid in inspection/repair of corrosion if found in the baggage compartment.

A. Inspect Baggage Compartment for Corrosion (See figure 201.)

(1) Remove divan and remove the baggage compartment interior panels.
(2) Remove interior panel at pressure bulkhead.
(3) Detach baggage compartment overehead liner sufficiently to permit inspection of structure.
(4) Carefully inspect structure for corrosion, particularly at the locations shown.
(5) If corrosion is not found, no further action is required.
(6) If corrosion is found, proceed to step 7.
(7) Using a dial indicator depth gauge (or equivalent), determine the extent of corrosion. (See figure 202.)

NOTE: ° Light Corrosion: Structure is discolored or pitted to a depth of approximately 0.001 inch maximum.

° Moderate Corrosion: Structure has blisters, scaling, flaking, and pitting at depth of 0.010 inch.

° Severe Corrosion: Structure has severe blisters, exfoliation, scaling, and pitting of depth greater than 0.010 inch.

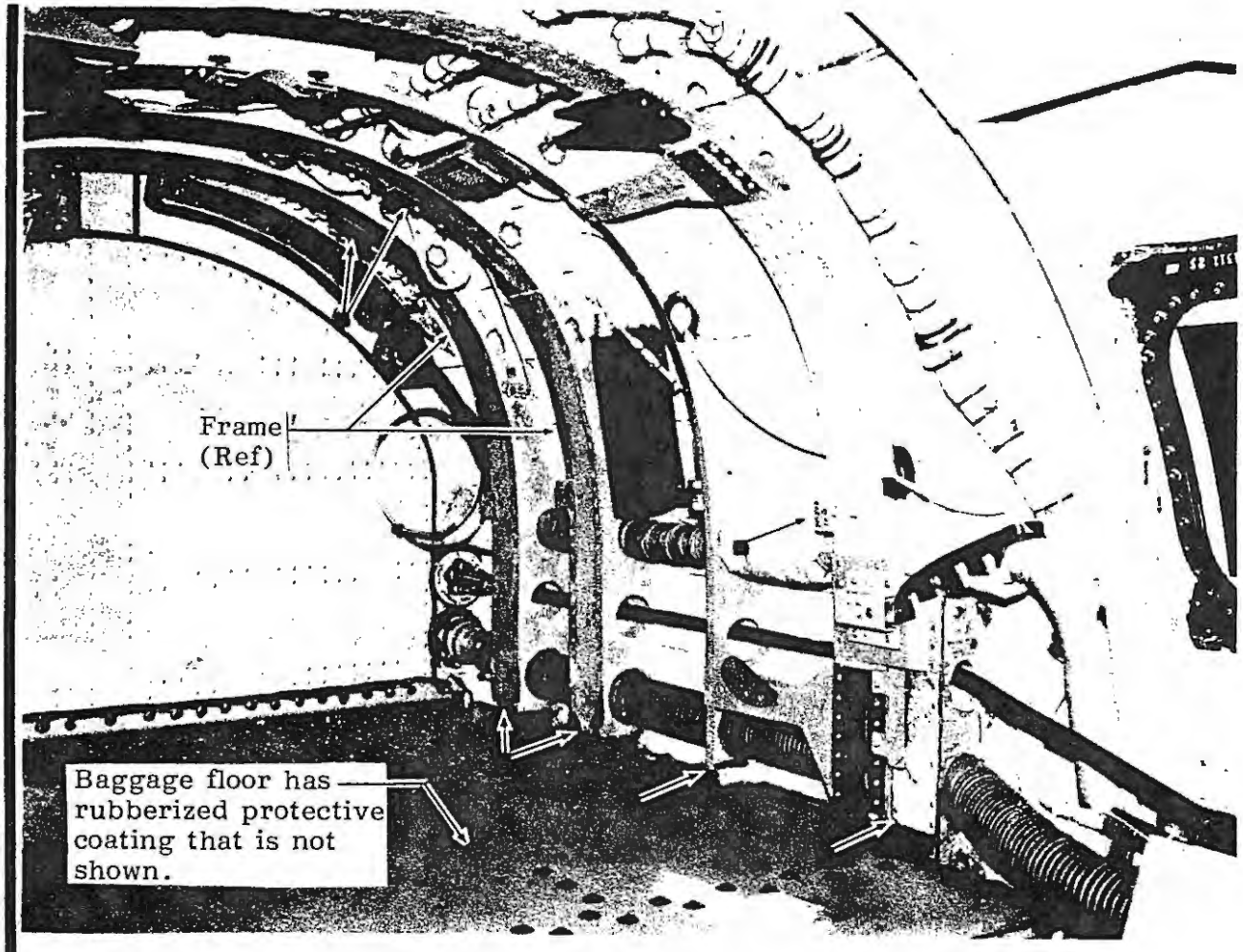
(a) If light or moderate corrosion is found, rework area per Approved Repairs.
(b) If severe corrosion is found, contact Gates Learjet Field Service Department for disposition.

2. APPROVED REPAIRS

A. Rework light or moderate corroded areas on structure as follows: (See figures 203 and 204.)

CAUTION: DO NOT USE STEEL WOOL OR STEEL WIRE BRUSHES OR SEVERE ABRASIVES WHEN REWORKING STRUCTURE FOR CORROSION. USE 240 GRIT OR FINER ALUMINUM OXIDE ABRASIVE PAPER. FINISH WITH 400 GRIT PAPER.

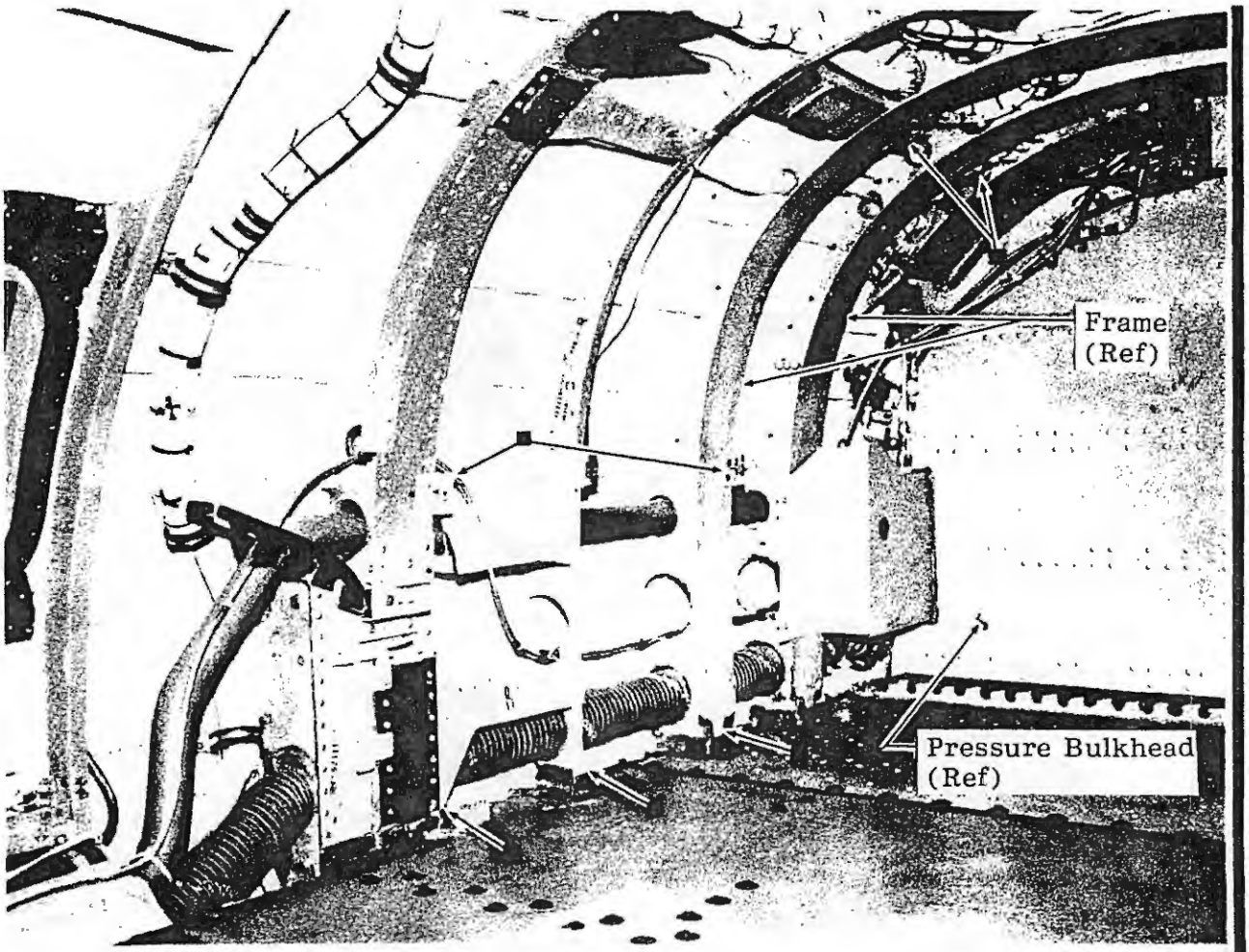
(1) Sand corroded areas using 240 grit or finer aluminum oxide abrasive paper.



■ Inspect carefully, especially in these locations.

VIEW OF LH SIDE OF BAGGAGE COMPARTMENT LOOKING AFT (TYPICAL)

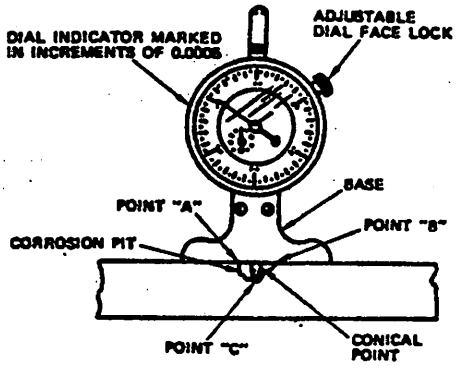
Inspect Baggage Compartment Structure for Corrosion
Figure 201 (Sheet 1 of 2)

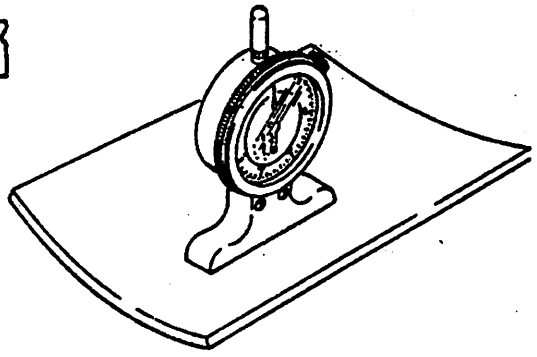


■ Inspect carefully, especially in these locations.

VIEW OF RH SIDE OF BAGGAGE COMPARTMENT LOOKING AFT (TYPICAL)

Inspect Baggage Compartment Structure for Corrosion
Figure 201 (Sheet 2 of 2)





DETAIL I

NOTE

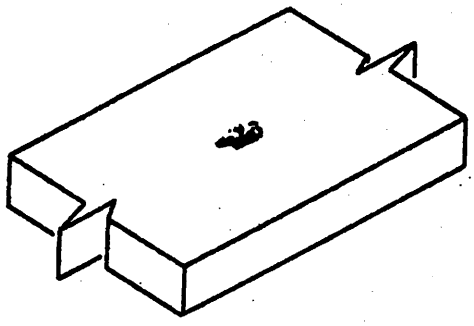
- DEPTH DIAL GAGE 0 TO 0.500 INCH RANGE.
- TAKE MEASUREMENT READINGS PERPENDICULAR TO THE RADIUS OF CONCAVE OR CONVEX SURFACES. SEE DETAIL I.
- TAKE MEASUREMENT READINGS ON EDGES ADJACENT TO CORROSION DAMAGE OR BLENDED DEPRESSION (POINTS "A" AND "B"). TAKE SEVERAL READINGS AROUND CENTER OF CORROSION DAMAGE OR BLENDED DEPRESSION (SEE DETAIL II) AND CONSIDER THE DEEPEST READING TO BE POINT "C." DETERMINE DEPTH AS FOLLOWS:

$$\text{DEPTH} = C - \frac{(A + B)}{2}$$



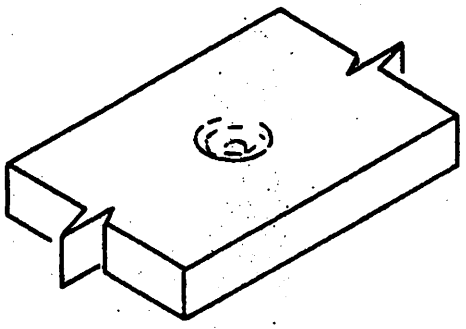
DETAIL II

Corrosion Damage and Rework Measurement
Figure 202



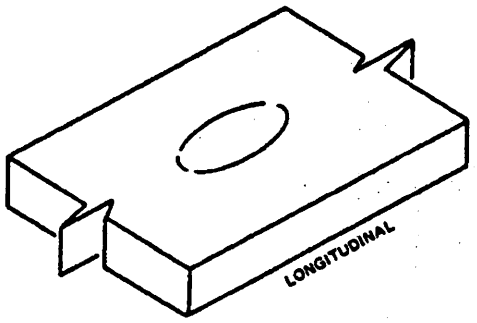
PIT HAS BEEN CLEANED UP TO THE EXTENT THAT ALL LOOSE CORROSION PRODUCTS HAVE BEEN REMOVED.

CORROSION DAMAGE BEFORE REWORK



ROUGH EDGES HAVE BEEN SMOOTHED AND ALL CORROSION HAS BEEN REMOVED. HOWEVER, DEPRESSION HAS NOT BEEN SHAPED.

DEPRESSION AFTER CORROSION REMOVAL



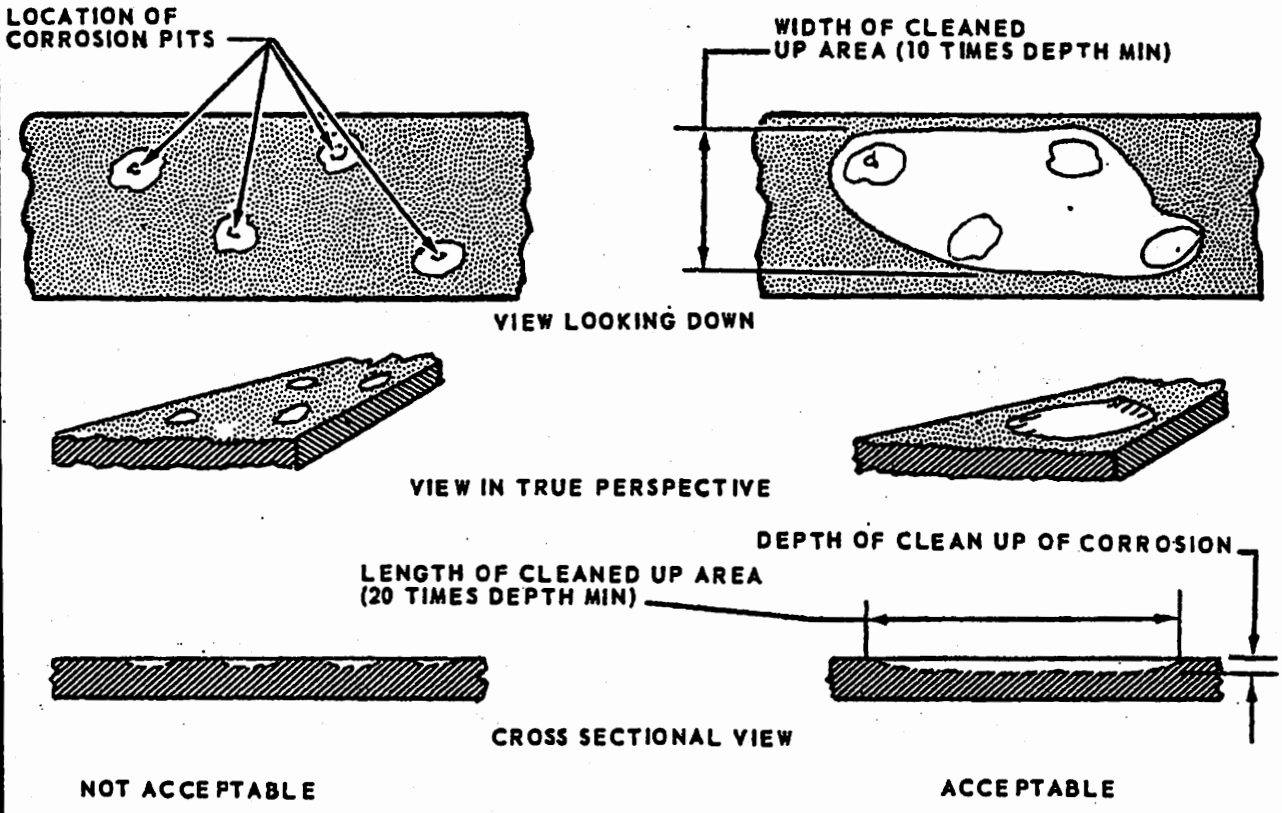
BLENDING HAS BEEN ACCOMPLISHED IN THE RATIO AND DIRECTION SHOWN IN FIGURE 204.

DISH-OUT AFTER BLENDING

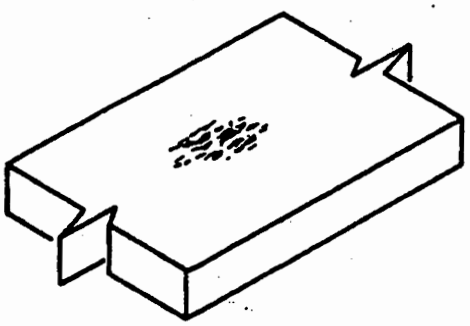
Blendout of Corrosion of Single Depression
Figure 203

CAUTION

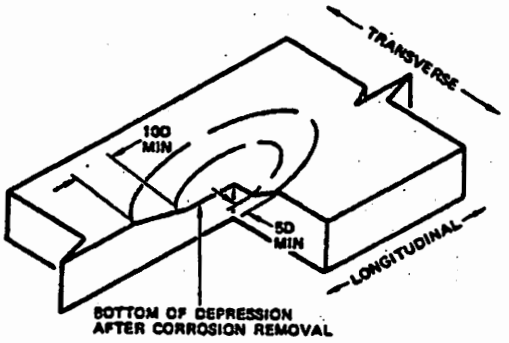
Do not use steel wool or steel wire brushes or severe abrasives when reworking structure for corrosion. Use 240 grit or finer aluminum oxide abrasive paper. Finish with 400 grit paper.



Blendout of Multiple Pits in Corroded Area
Figure 204 (Sheet 1 of 2)



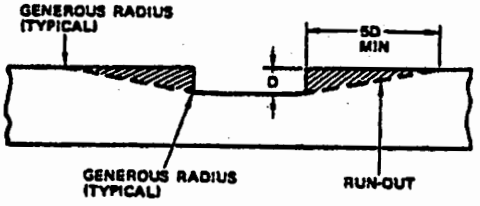
CORROSION DAMAGE
BEFORE REMOVAL



DAMAGE REMOVED AND SURFACE SMOOTHED
WITH SHALLOW ELLIPTICAL DISH-OUT

NOTE

- D = DEPTH OF DEPRESSION
- REFER TO SPECIFIC ALLOWABLE DAMAGE LIMITS FOR MAXIMUM ALLOWABLE DEPTH.
- SINCE MAXIMUM DEPTH VARIES AT DIFFERENT LOCATIONS, MAXIMUM SIZE OF DISH-OUT WILL ALSO VARY.
- THE BLENDING RATIO SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE SPECIFIED IN A SPECIFIC REPAIR.
- SEE DETAIL I FOR EXAMPLE OF BLENDING.



EXAMPLE OF 1:5 BLENDING RATIO
DETAIL I

Blendout of Multiple Pits in Corroded Area
Figure 204 (Sheet 2 of 2)

(2) Blend out pits in structure as shown.

WARNING: ° WEAR PROTECTIVE MASK AND ASSURE AREA IS WELL VENTILATED WHILE CLEANING STRUCTURE WITH METHYL-ETHYL-KETONE (MEK).

° ASSURE THAT MANUFACTURER'S PUBLISHED INSTRUCTIONS ARE FOLLOWED WHEN USING CLEANING AGENTS AND METAL FINISHES.

(3) Clean sanded surfaces with a Methyl-Ethyl-Ketone (MEK) dampened cloth. Wipe surfaces dry using a clean dry cloth.

(4) Apply chemical film treatment on reworked surfaces as follows:

(a) Obtain Turcoat Accelagold chemical film treatment, manufatured by Turco Products Company, Wilmington, California.

NOTE: Any equivalent chemical film treatment for aluminum alloy may be used providing it complies with MIL-C-5541 class 1 metal finish.

(b) Brush chemical film over sanded surfaces until a satisfactory chemical film is obtained.

(c) Gently sponge over chemically treated surfaces using warm water. Do not rub surfaces. Allow surfaces to air dry.

(5) Apply a brush coat of epoxy primer on chemically treated surfaces as follows:

NOTE: ° Use either of the primer systems described below:

° Thoroughly mix one volume of base primer #515-344 and one volume of curing solution #910-350, Super Koropon Fluid Resistant Primer available from: Desoto, Inc., P.O. Box 401268, Garland, TX 75040. Telephone (214) 276-5181.

° Thoroughly mix one volume of primer base #563-12-8 and one volume of Catalyst CA-116 Cat-A-Lac corrosion resistant primer available from: Bostik Div. Emhart Corp., 20846 S. Normandie Ave., Torrance, CA 90502. Telephone (213) 320-6800.

° Thoroughly mix one volume of primer base #438-660 and one volume of curing agent #120-650 available from Wichita Division, Pratt & Lambert, P.O. Box 2153, Wichita, KS 67201. Telephone (316) 733-1361.

(a) After one of the primer systems described above has been thoroughly mixed, apply a brush coat over the prepared surfaces.

(b) Allow primer to dry at room temperature for a minimum of two hours.

(6) Replace baggage compartment liner.

NOTE: The liner backing can be reused providing the backing is thoroughly washed with soap and water.

(a) Install baggage compartment liner.
(b) Reinstall divan.